

SMILE Answers

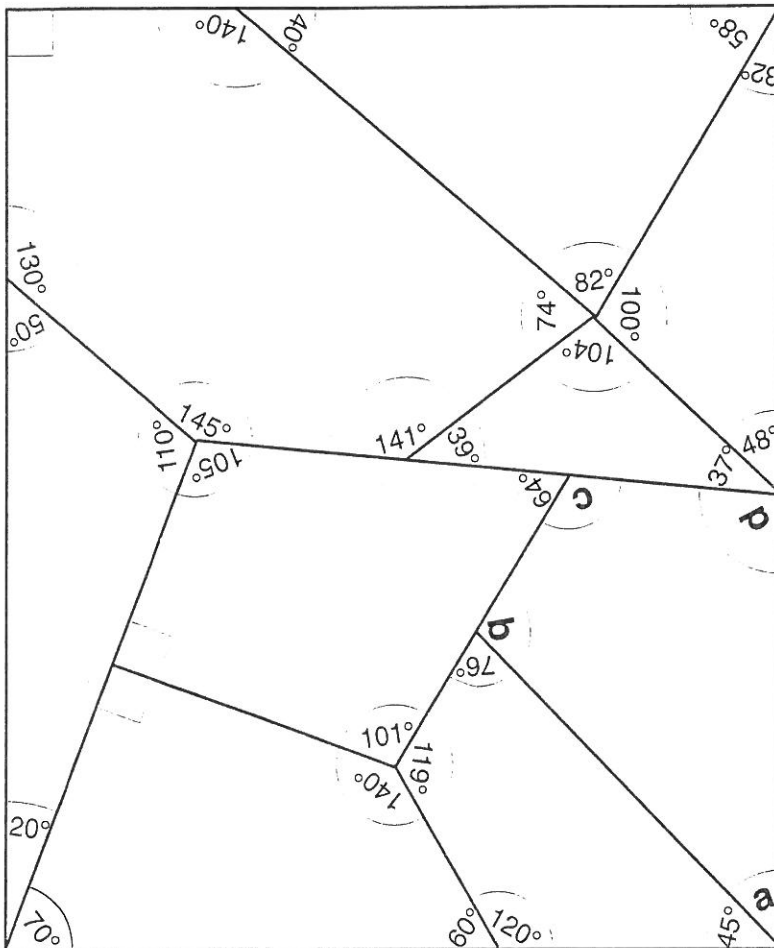
2358

to

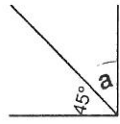
2381

2358 Angle Fit

1. Here is the completed rectangle.



2. $45^\circ + a = 90^\circ$
 $a = 45^\circ$



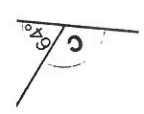
Angles in a rectangle.

$76^\circ + b = 180^\circ$
 $b = 104^\circ$



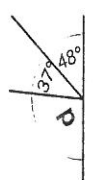
Angles on a straight line add up to 180°.

$64^\circ + c = 180^\circ$
 $c = 116^\circ$



Angles on a straight line add up to 180°.

$48^\circ + 37^\circ + d = 95^\circ$
 $d = 95^\circ$



Angles on a straight line add up to 180°.

2359 Approximate Solutions

1. An approximate solution to 46×17 is 1000. ($50 \times 20 = 1000$)

2.

calculations	rough calculations	rough answers
$583 \div 18$	$600 \div 20$	30
408×68	400×70	28000
$875 \div 23$	$900 \div 20$	45
79×22	80×20	1600
$576 \div 27$	$600 \div 30$	20
67×81	70×80	5600

3.

calculations	rough calculations (approximations)	rough answers (approximate solutions)
71×88	70×90	6300
$383 \div 53$	$400 \div 50$	8
49×48	50×50	2500

4. a) 1170×42 and 1200×40 must be wrong.
 b) $1100 \div 50$ and $1200 \div 40$ would give approximate solutions.
 c) $1200 \div 40$ would give a closer approximation.

5.

	calculations	approximations	approximate solutions
a)	36×12	40×10	400
b)	$1796 \div 62$	$1800 \div 60$	30
c)	1950×11	2000×10	20000
d)	$1950 \div 205$	$2000 \div 200$	10

6. Approximately £10000.

calculations	approximations	approximate solutions
214×52	200×50	10000

7. Approximately 900 centicubes.

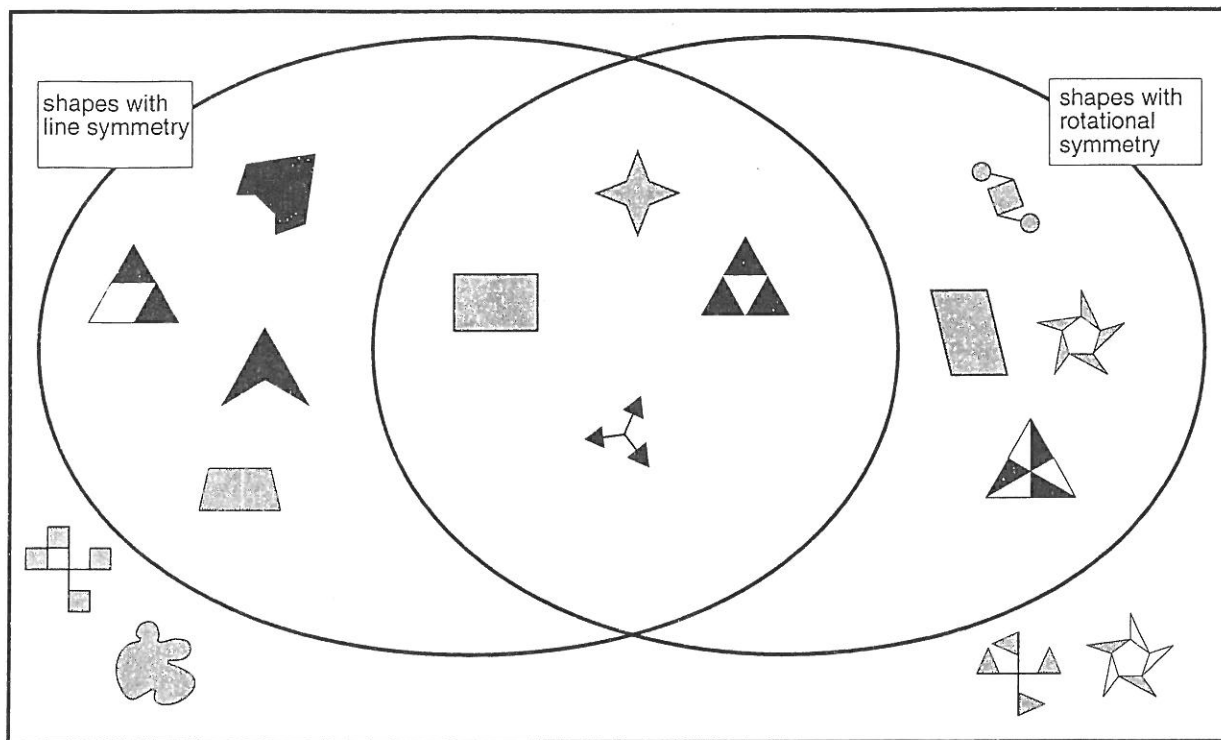
calculations	approximations	approximate solutions
27×29	30×30	900

8. Approximately 25 pints of milk.

calculations	approximations	approximate solutions
$485 \div 22$	$500 \div 20$	25

2360 Rotational and Line Symmetry Review

Your completed Venn diagram should have the following shapes in the correct region.



3. You should have drawn one shape in each region.
Check with your teacher that your shapes are in the correct region.

2361 Right-angle or not?

2.

Angle	Right-angle
A	Yes
B	No
C	No
D	Yes
E	Yes
F	No
G	No
H	Yes
I	No
J	No
K	Yes
L	No

3. Get your teacher to check that you have drawn a right-angle properly.

continued/



2361 Right-angle or not? (cont)

4. You could have mentioned:

- the corner of a book
- the corner of the white board
- the corner of a cupboard
- the corner of the filing cabinet ...

Ask your teacher to check.

2362 Decimal Routes

								
$0.2 + 1.3$ = 1.5	0.3×10 = 3	2×1.5 = 3	$7 \div 4$	1.5×2 3	$0.7 + 0.8$ = 1.5	$3 \div 2$ = 1.5	$1 + 2.5$	1.3×10
$15 \div 10$ = 1.5	$4 - 0.5$	$7 - 5.5$ = 1.5	$18 \div 5$	$0.5 + 1.5$	1.4×11	$4.5 - 1.5$ = 3	$1 \div 2$	$1 + 0.05$
$1.1 + 0.4$ = 1.5	$2.5 - 1$ = 1.5	$4.5 \div 3$ = 1.5	$0.5 + 1$ = 1.5	$10 - 8.5$ = 1.5	$16 \div 10$	3×0.5 = 1.5	$0.5 + 0.6$	$1 + 5$
$1.8 - 0.4$	$1.8 - 0.3$ = 1.5	$5.2 \div 2$	$6 + 3.3$	0.5×6 = 3	$7.5 \div 5$ = 1.5	$1.6 - 0.1$ = 1.5	0.5×10	3×0.1
0.4×10	$2.3 + 0.7$ = 3	$6.5 - 5$ = 1.5	0.2×1.5	$1.4 + 1.4$	3×1.5	$1 \div 5$	$5 \div 10$	3×0.5
$6.3 - 3$	$5.3 - 2$	0.75×2 = 1.5	1×0.3	$1.6 + 1.3$	$1.5 + 2.5$	0.2×1.5	$7 \div 5$	$0.2 \div 4$
$3 \div 0.5$	$6.5 \div 4$	12×0.25 = 3	$4 \div 3$	$0.1 - 1.5$	$3.5 - 0.1$	$1.3 + 1.2$	$6 \div 0.5$	$4 - 3$
$3.5 \div 2$	$5 + 4$	$30 \div 20$ = 1.5	$0.6 + 0.9$ = 1.5	$30 \div 10$ = 3	$11.5 \div 10$	6×0.2	$7.1 - 3.1$	$3 \div 4$
								

2363 Conversion Pack 1

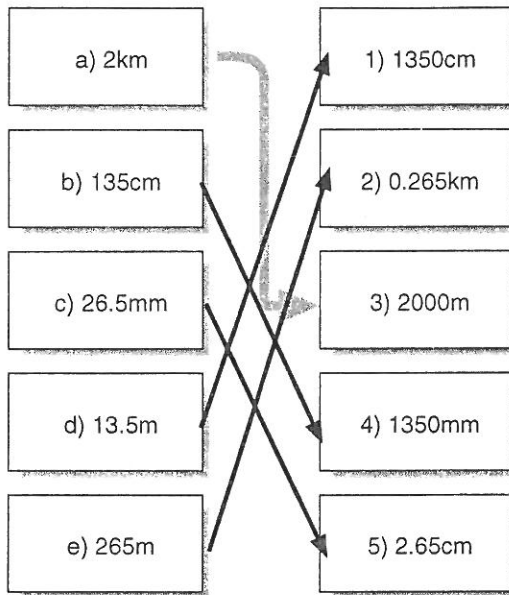
Card A

- 1 gallon = 8 pints
- 25 gallons = (8 x 25) pints
- 25 gallons = 200 pints

continued/

2363 Conversion Pack 1 (cont)

Card B



Card C

1 stone = 14lb

9 stone = (9 x 14)lb

9 stone = 126lb

Liz's weight is 9 stone 7lb = 126lb + 7lb = 134lb

Sam's weight is 160lb

Sam is heavier.

Card D

1ft = 12 inches

4ft = (4 x 12) inches

4ft = 48 inches

4ft 5 inches = (48 + 5) inches

The rug is 53 inches long.

Card E

1 litre = 1000ml

1000ml - 57ml = 943ml

There will be 943 millilitres left in the beaker.

Card F

1kg = 1000g

5kg = (5 x 1000)g

5kg = 5000g

Contents of Tim's bag

Camera	900g
Water (1.2 x 1000)	1200g
Book	350g
Crisps	75g
Wash Bag (1.4 x 1000)	1400g
Travel guide	600g

Total weight of Tim's bag = 4525g (4.525kg)

Tim's bag is not too heavy.

2364 Decimal Playing Cards (SMILE)

This pack contains 52 cards which represent 13 different decimals, 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0, each in 4 ways.

- decimal written as a number
- decimal written in words
- square representation of a decimal
- a number line representing a decimal

You can use the playing cards with a number of SMILE activities, but inside the pack there are some suggested games for you to play.

2365 Higher Decimal Win

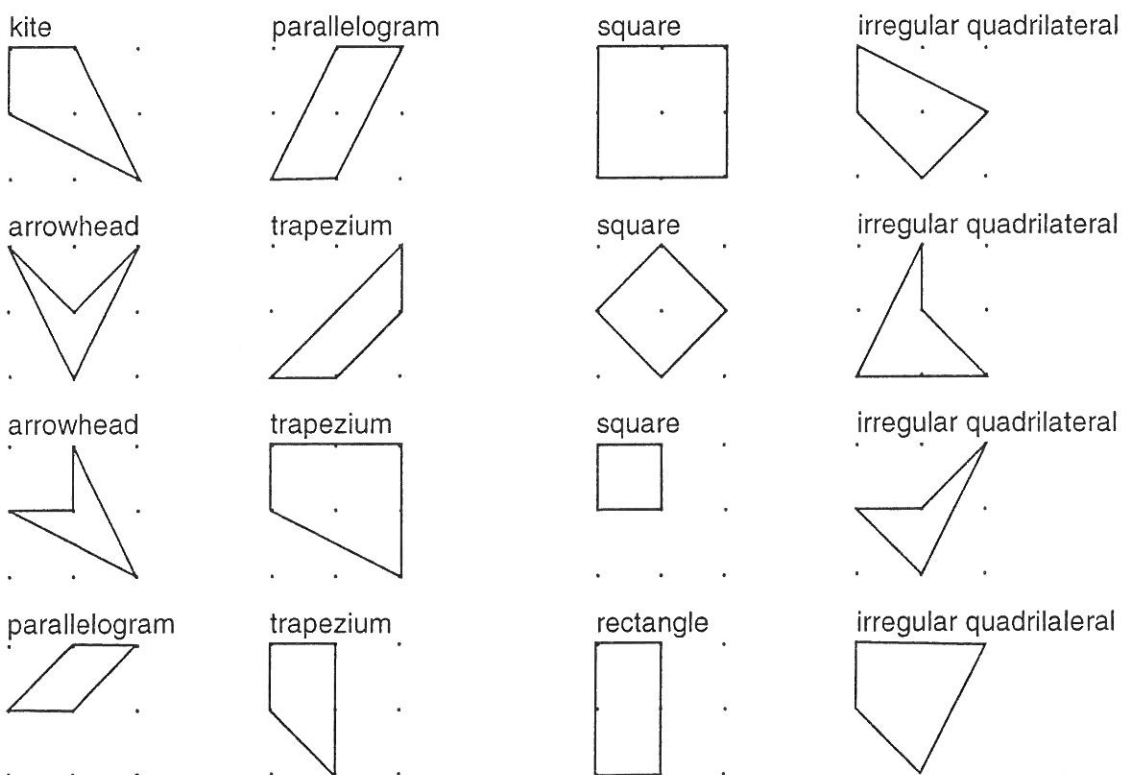
You should find that the best cards to turn over are: 0.62, 0.7, 0.75, 0.8, 0.92, 1.0.

2366 Decimal Difference

You should show your results to your teacher.

2367 Sixteen Quadrilaterals

1. These are the shapes you should have found.

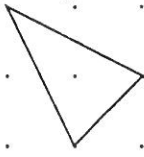


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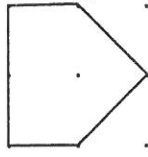
2367 Sixteen Quadrilaterals (cont)

2. It is also possible to find triangles, pentagons, hexagons and heptagons on a 9 point grid.

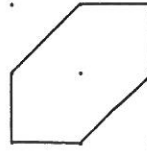
e.g. triangle



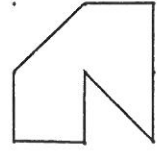
pentagon



hexagon



heptagon



2368 Matching Decimals

- 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0
- 0.8 is larger.
- 0.65 is smaller.
- 0.8 is the largest.
- You could have written the following decimals which are used on the cards.
0.62, 0.7, 0.75 If you have written a different decimal, check your answer with your teacher.
- Some possible answers are:
0.36, 0.37, 0.38, 0.39.
If your decimal is different, check your answer with your teacher.

2369 Decimal Sort

2. Here are examples of three different decimal 'set's.

Line 1 0	Number 0.04	Word nought point nought four	Square 	Line 1 0	Number 0.7	Word nought point seven	Square
Line 1 0	Number 0.25	Word nought point two five	Square 				

3. Show your completed sets to your teacher.

2370 Conversion Pack 2

Card A **1 gallon \approx 4.5 litres**

£0.59 per litre 1 gallon costs $(£0.59 \times 4.5) = £2.655 = £2.66$
£0.59 per litre is cheaper than £2.80 per gallon.

Card B **1 litre \approx 1.75 pints**

1.5 litres $\approx (1.5 \times 1.75)$ pints ≈ 2.625 pints
The 1.5 litre bottle contains most liquid.

Card C **1 yard = 3ft = (3 x 12) inches** **1 inch \approx 2.5cm**
1 yard = 36 inches 36 inches $\approx (36 \times 2.5)$ cm

1 yard \approx 90cm
One metre is longer than one yard.

Card D **8km \approx 5 miles**
1km \approx 5/8 miles

Paris = 200km $\approx (200 \times 5/8)$ miles ≈ 125 miles
Lille = 240km $\approx (240 \times 5/8)$ miles ≈ 150 miles

Card E **1kg \approx 2.2lb**

10lb potatoes cost £1.19
1lb potatoes costs $(£1.19 \div 10) = £0.119$

1kg \approx 2.2lb potatoes cost $(2.2 \times £0.119) = £0.2618$
5kg cost $(5 \times £0.2618) = £1.309$
A 5kg bag of potatoes should cost £1.31

Card F **1kg = 1000g \approx 2.2lb** **1lb = 16oz**

1lb $\approx (1000 \div 2.2)$ g ≈ 454.54 g
1oz $\approx (454.54 \div 16)$ g ≈ 28.409 g
6oz ≈ 170.45 g

240g is enough cottage cheese for the mackerel pate.

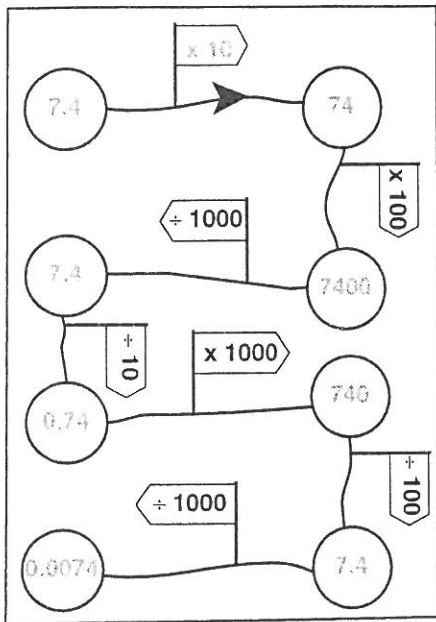
2371 Rounding to 10

1. a) 60 b) 30 c) 50 d) 10
 e) 80 f) 60 g) 10 h) 100

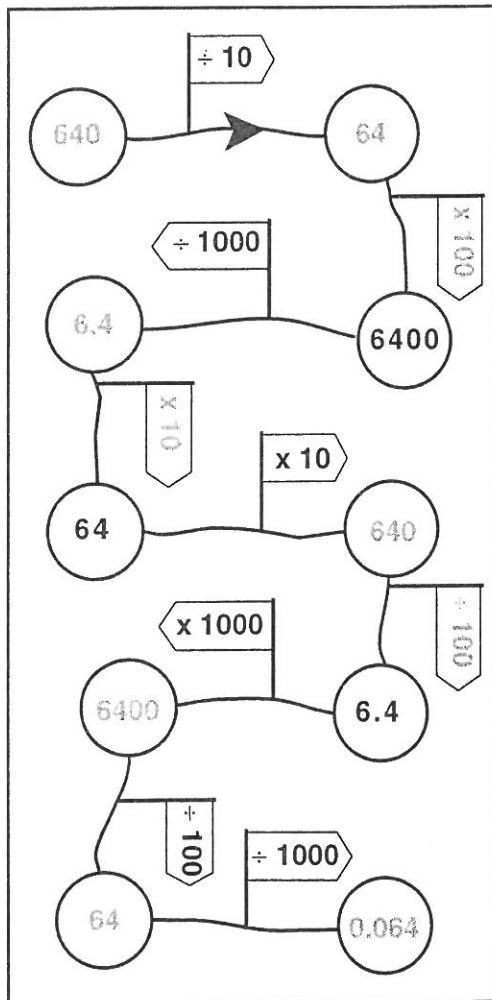
2. Play the game sufficient times until you can quickly round each number to the nearest 10.
-

2372 Powers of Ten Flags

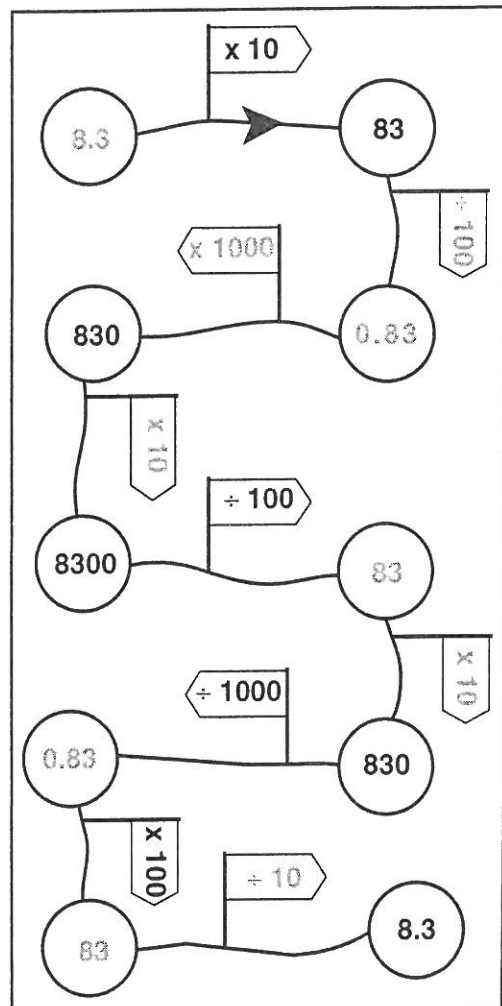
1.



2.



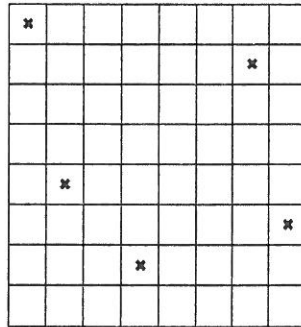
3.



2373 Queens (Micro/SfW)

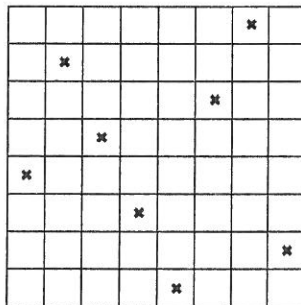
Queens

Here is one arrangement of 5 Queens on an 8 by 8 chessboard, so that the Queens are protecting every square. Your arrangement may be a reflection of the one shown.



Avoiding Each Other

Here is one arrangement of 8 Queens on an 8 x 8 chessboard so that no two Queens are in line with each other. Your arrangement may be a reflection of the one shown.



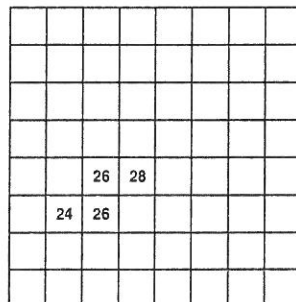
Investigating Queens

On an 8 x 8 board, the largest number of squares which can be protected with just one Queen is 28.

There are many questions that can be asked:

- Can a Queen protect an odd number of squares?
- What is the smallest number of squares a Queen can protect?

Drawing and numbering the board might help you to see patterns and to decide on the best possible position for the Queen.



To find a rule for squares it might help to look at odd and even sized boards, but it may be easier to get a general rule for rectangles which are not square.

2374 Equivalent Fractions Pairs

1. a) Here are two different sets of equivalent fraction pairs.

$$\frac{6}{10} \equiv \frac{3}{5} \qquad \frac{8}{10} \equiv \frac{4}{5}$$

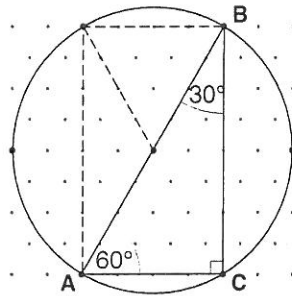
$$\frac{1}{2} \equiv \frac{4}{8} \qquad \text{or} \qquad \frac{2}{3} \equiv \frac{6}{9}$$

You may have found different sets of equivalent fraction pairs. If you are unsure whether your equivalent fraction pairs are correct, check them with your teacher.

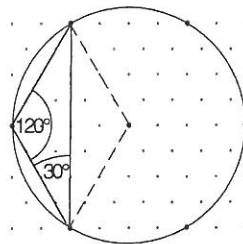
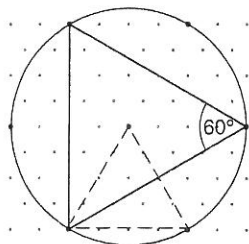
- b) 7 and 9 are not used. or 1 and 7 are not used.
2. a) This is one set of 4 equivalent fraction pairs. You may have used the numbers to create different equivalent fractions.
- b) The numbers not used were:
11, 13, 17 and 19. All prime numbers larger than 10.

2375 Polygons in Circles

1. c) $\angle BAC = 60^\circ$ because isometric paper is created from equilateral triangles.
 $\angle ABC = 30^\circ$ because angles of a triangle add up to 180° .



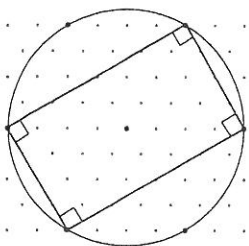
2. a) Equilateral triangle b) Isosceles triangle



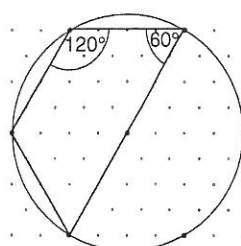
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2375 Polygons in Circles (cont)

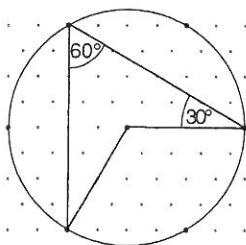
c) A rectangle



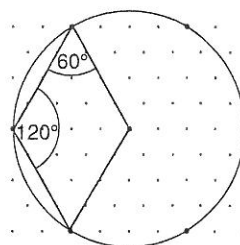
d) A trapezium



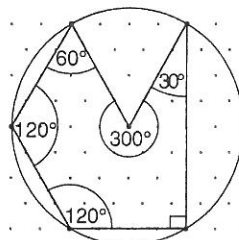
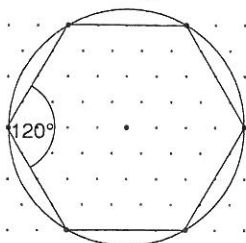
e) An arrowhead



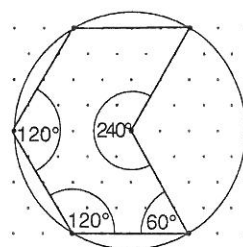
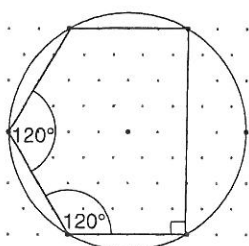
f) A rhombus



g) A hexagon



h) A pentagon



3. If your polygons are similar to those given in question 2, all the shapes are cyclic except:
- the equilateral triangle with one vertex at the centre of the circle.
 - the isosceles triangle with one vertex at the centre of the circle.
 - the arrowhead
 - the rhombus
 - the irregular hexagon
 - the pentagon with one vertex at the centre of the circle.
-

2376 Maths in Your Head (SMILE)

No answers required

2377 TenSprint(SfW)

You may have played the game against the clock. Well done if you managed to run the 200m race in less than 3 minutes.

If the five dice showed these numbers, you could make 6 lots of 10.

2378 Matching Fractions(SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2379 Ordering Fractions (SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2380 NumberLines (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLine Certificate.

2381 NumberLinesD (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLineD Certificate.

SMILE Answers

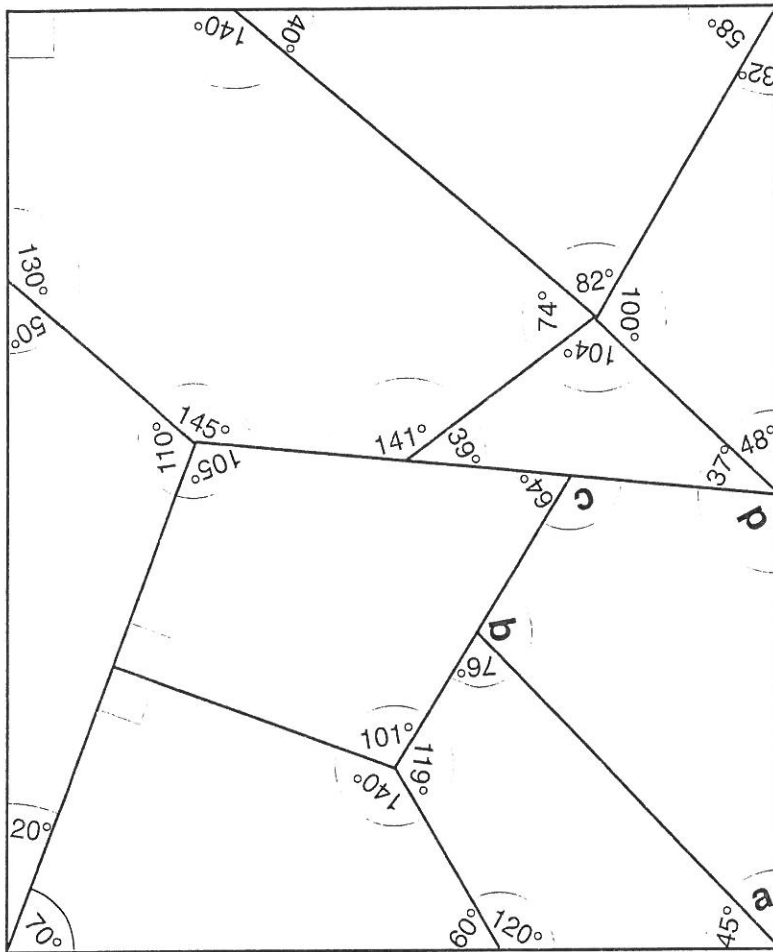
2358

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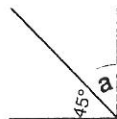
2381

2358 Angle Fit

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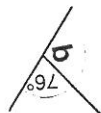


2. $45^\circ + a = 90^\circ$
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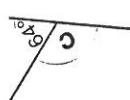
Angles in a rectangle.

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 $c = 116^\circ$



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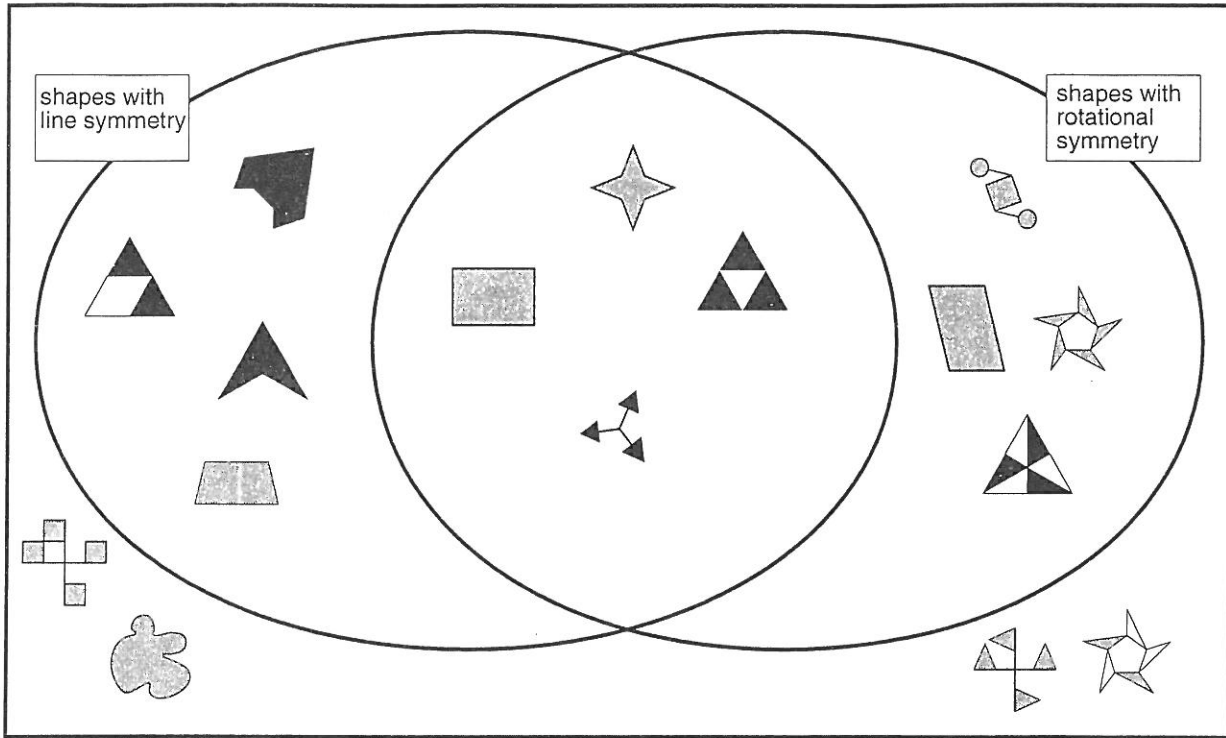
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3. You should have drawn one shape in each region.
Check with your teacher that your shapes are in the correct region.

2361 Right-angle or not?

2.

Angle	Right-angle
A	Yes
B	No
C	No
D	Yes
E	Yes
F	No
G	No
H	Yes
I	No
J	No
K	Yes
L	No

3. Get your teacher to check that you have drawn a right-angle properly.

continued/



2361 Right-angle or not? (cont)

4. You could have mentioned:

- the corner of a book
- the corner of the white board
- the corner of a cupboard
- the corner of the filing cabinet ...

Ask your teacher to check.

2362 Decimal Routes

								
$0.2 + 1.3$ = 1.5	0.3×10 = 3	2×1.5 = 3	$7 \div 4$	1.5×2 3	$0.7 + 0.8$ = 1.5	$3 \div 2$ = 1.5	$1 + 2.5$	1.3×10
$15 \div 10$ = 1.5	$4 - 0.5$	$7 - 5.5$ = 1.5	$18 \div 5$	$0.5 + 1.5$	1.4×11	$4.5 - 1.5$ = 3	$1 \div 2$	$1 + 0.05$
$1.1 + 0.4$ = 1.5	$2.5 - 1$ = 1.5	$4.5 \div 3$ = 1.5	$0.5 + 1$ = 1.5	$10 - 8.5$ = 1.5	$16 \div 10$	3×0.5 = 1.5	$0.5 + 0.6$	$1 + 5$
$1.8 - 0.4$	$1.8 - 0.3$ = 1.5	$5.2 \div 2$	$6 + 3.3$	0.5×6 = 3	$7.5 \div 5$ = 1.5	$1.6 - 0.1$ = 1.5	0.5×10	3×0.1
0.4×10	$2.3 + 0.7$ = 3	$6.5 - 5$ = 1.5	0.2×1.5	$1.4 + 1.4$	3×1.5	$1 \div 5$	$5 \div 10$	3×0.5
$6.3 - 3$	$5.3 - 2$	0.75×2 = 1.5	1×0.3	$1.6 + 1.3$	$1.5 + 2.5$	0.2×1.5	$7 \div 5$	$0.2 \div 4$
$3 \div 0.5$	$6.5 \div 4$	12×0.25 = 3	$4 \div 3$	$0.1 - 1.5$	$3.5 - 0.1$	$1.3 + 1.2$	$6 \div 0.5$	$4 - 3$
$3.5 \div 2$	$5 + 4$	$30 \div 20$ = 1.5	$0.6 + 0.9$ = 1.5	$30 \div 10$ = 3	$11.5 \div 10$	6×0.2	$7.1 - 3.1$	$3 \div 4$
								

2363 Conversion Pack 1

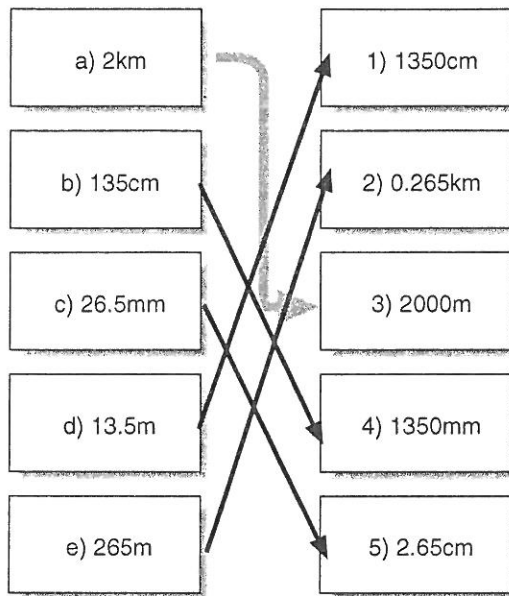
Card A

- 1 gallon = 8 pints
- 25 gallons = (8 x 25) pints
- 25 gallons = 200 pints

continued/

2363 Conversion Pack 1 (cont)

Card B



Card C

1 stone = 14lb

9 stone = (9 x 14)lb

9 stone = 126lb

Liz's weight is 9 stone 7lb = 126lb + 7lb = 134lb

Sam's weight is 160lb

Sam is heavier.

Card D

1ft = 12 inches

4ft = (4 x 12) inches

4ft = 48 inches

4ft 5 inches = (48 + 5) inches

The rug is 53 inches long.

Card E

1 litre = 1000ml

1000ml - 57ml = 943ml

There will be 943 millilitres left in the beaker.

Card F

1kg = 1000g

5kg = (5 x 1000)g

5kg = 5000g

Contents of Tim's bag

Camera	900g
Water (1.2 x 1000)	1200g
Book	350g
Crisps	75g
Wash Bag (1.4 x 1000)	1400g
Travel guide	600g

Total weight of Tim's bag = 4525g (4.525kg)

Tim's bag is not too heavy.

2364 Decimal Playing Cards (SMILE)

This pack contains 52 cards which represent 13 different decimals, 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0, each in 4 ways.

- decimal written as a number
- decimal written in words
- square representation of a decimal
- a number line representing a decimal

You can use the playing cards with a number of SMILE activities, but inside the pack there are some suggested games for you to play.

2365 Higher Decimal Win

You should find that the best cards to turn over are: 0.62, 0.7, 0.75, 0.8, 0.92, 1.0.

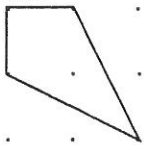
2366 Decimal Difference

You should show your results to your teacher.

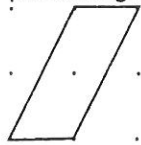
2367 Sixteen Quadrilaterals

1. These are the shapes you should have found.

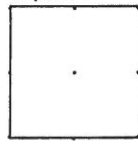
kite



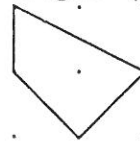
parallelogram



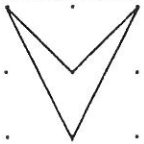
square



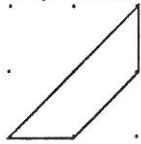
irregular quadrilateral



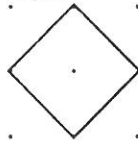
arrowhead



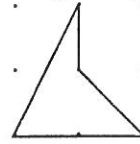
trapezium



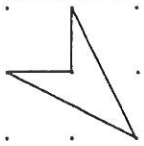
square



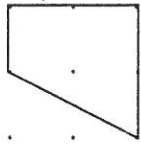
irregular quadrilateral



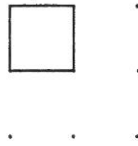
arrowhead



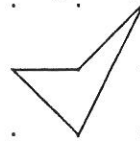
trapezium



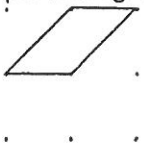
square



irregular quadrilateral



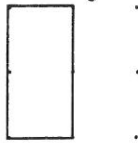
parallelogram



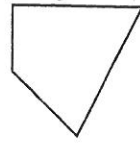
trapezium



rectangle



irregular quadrilateral

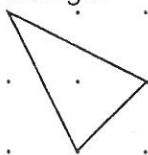


continued/

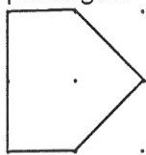
2367 Sixteen Quadrilaterals (cont)

2. It is also possible to find triangles, pentagons, hexagons and heptagons on a 9 point grid.

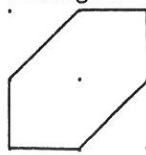
e.g. triangle



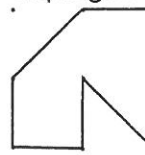
pentagon



hexagon



heptagon



2368 Matching Decimals

1. 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0
2. 0.8 is larger.
3. 0.65 is smaller.
4. 0.8 is the largest.
5. You could have written the following decimals which are used on the cards.
0.62, 0.7, 0.75 If you have written a different decimal, check your answer with your teacher.
6. Some possible answers are:
0.36, 0.37, 0.38, 0.39.
If your decimal is different, check your answer with your teacher.

2369 Decimal Sort

2. Here are examples of three different decimal 'set's.

Line 1 0	Number 0.04 Number	Word nought point nought four Word	Square Squares	Line 1 0	Number 0.7 Number	Word nought point seven Word	Square Squares
Line 1 0	Number 0.25 Number	Word nought point two five Word	Square Squares				

3. Show your completed sets to your teacher.

2370 Conversion Pack 2

Card A **1 gallon \approx 4.5 litres**

£0.59 per litre 1 gallon costs $(£0.59 \times 4.5) = £2.655 = £2.66$
£0.59 per litre is cheaper than £2.80 per gallon.

Card B **1 litre \approx 1.75 pints**

1.5 litres $\approx (1.5 \times 1.75)$ pints ≈ 2.625 pints
The 1.5 litre bottle contains most liquid.

Card C **1 yard = 3ft = (3 x 12) inches** **1 inch \approx 2.5cm**
1 yard = 36 inches 36 inches $\approx (36 \times 2.5)$ cm

1 yard \approx 90cm
One metre is longer than one yard.

Card D **8km \approx 5 miles**
1km \approx 5/8 miles

Paris = 200km $\approx (200 \times 5/8)$ miles ≈ 125 miles
Lille = 240km $\approx (240 \times 5/8)$ miles ≈ 150 miles

Card E **1kg \approx 2.2lb**

10lb potatoes cost £1.19
1lb potatoes costs $(£1.19 \div 10) = £0.119$

1kg \approx 2.2lb potatoes cost $(2.2 \times £0.119) = £0.2618$
5kg cost $(5 \times £0.2618) = £1.309$
A 5kg bag of potatoes should cost £1.31

Card F **1kg = 1000g \approx 2.2lb** **1lb = 16oz**

1lb $\approx (1000 \div 2.2)$ g ≈ 454.54 g
1oz $\approx (454.54 \div 16)$ g ≈ 28.409 g
6oz ≈ 170.45 g

240g is enough cottage cheese for the mackerel pate.

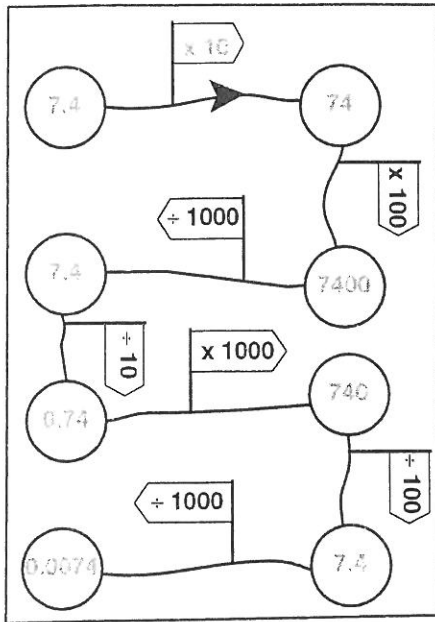
2371 Rounding to 10

1. a) 60 b) 30 c) 50 d) 10
 e) 80 f) 60 g) 10 h) 100

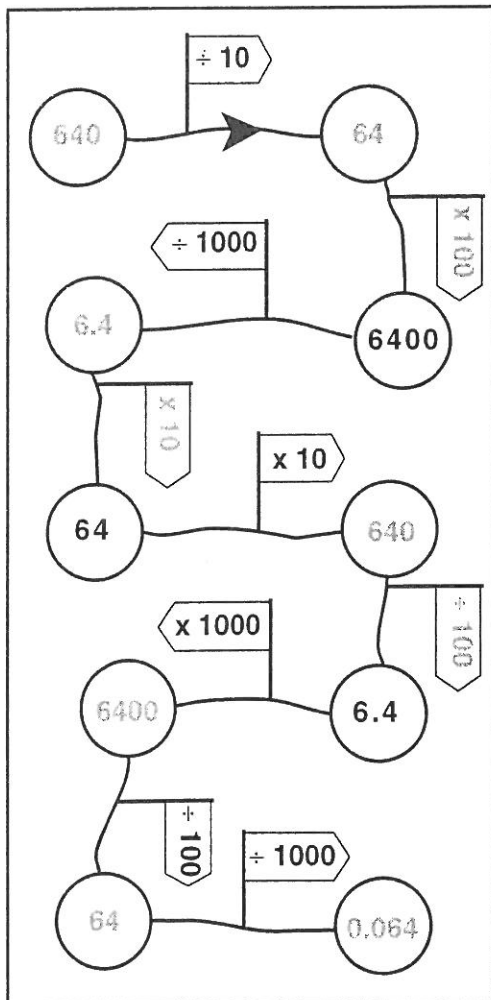
2. Play the game sufficient times until you can quickly round each number to the nearest 10.
-

2372 Powers of Ten Flags

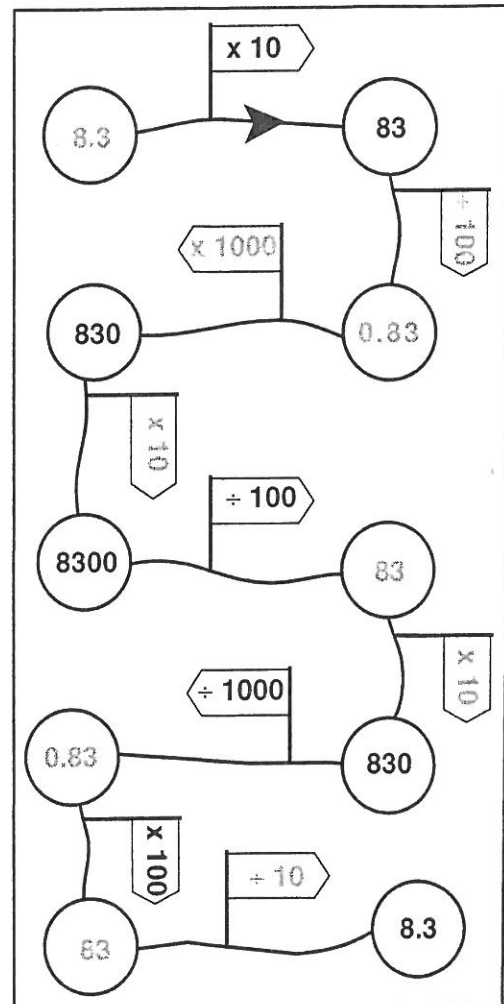
1.



2.



3.



2373 Queens (Micro/SfW)

Queens

Here is one arrangement of 5 Queens on an 8 by 8 chessboard, so that the Queens are protecting every square. Your arrangement may be a reflection of the one shown.

*							
						*	
	*						
							*
			*				

Avoiding Each Other

Here is one arrangement of 8 Queens on an 8 x 8 chessboard so that no two Queens are in line with each other. Your arrangement may be a reflection of the one shown.

						*	
	*						
					*		
		*					
*							
			*				
							*
				*			

Investigating Queens

On an 8 x 8 board, the largest number of squares which can be protected with just one Queen is 28.

There are many questions that can be asked:

- Can a Queen protect an odd number of squares?
- What is the smallest number of squares a Queen can protect?

Drawing and numbering the board might help you to see patterns and to decide on the best possible position for the Queen.

		26	28				
	24	26					

To find a rule for squares it might help to look at odd and even sized boards, but it may be easier to get a general rule for rectangles which are not square.

2374 Equivalent Fractions Pairs

1. a) Here are two different sets of equivalent fraction pairs.

$$\frac{6}{10} \equiv \frac{3}{5} \qquad \frac{8}{10} \equiv \frac{4}{5}$$

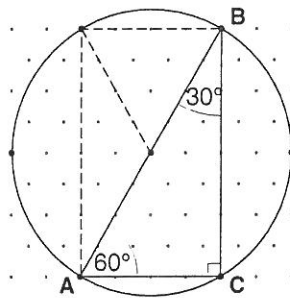
$$\frac{1}{2} \equiv \frac{4}{8} \qquad \text{or} \qquad \frac{2}{3} \equiv \frac{6}{9}$$

You may have found different sets of equivalent fraction pairs. If you are unsure whether your equivalent fraction pairs are correct, check them with your teacher.

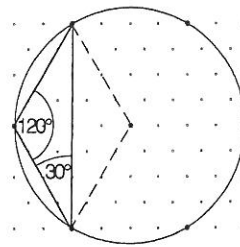
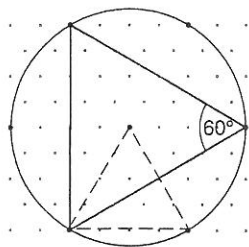
- b) 7 and 9 are not used. or 1 and 7 are not used.
2. a) This is one set of 4 equivalent fraction pairs. You may have used the numbers to create different equivalent fractions.
- b) The numbers not used were:
11, 13, 17 and 19. All prime numbers larger than 10.

2375 Polygons in Circles

1. c) $\angle BAC = 60^\circ$ because isometric paper is created from equilateral triangles.
 $\angle ABC = 30^\circ$ because angles of a triangle add up to 180° .



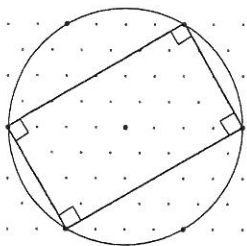
2. a) Equilateral triangle b) Isosceles triangle



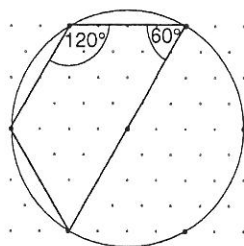
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2375 Polygons in Circles (cont)

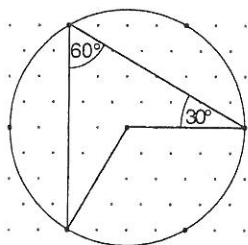
c) A rectangle



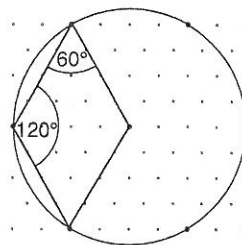
d) A trapezium



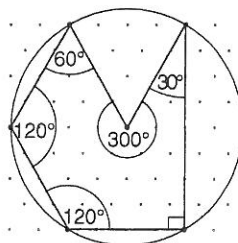
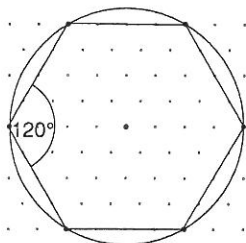
e) An arrowhead



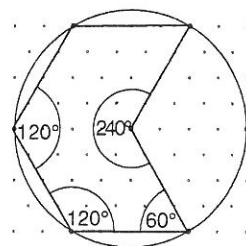
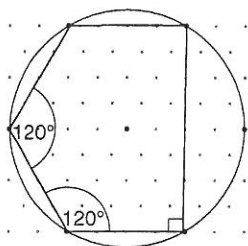
f) A rhombus



g) A hexagon



h) A pentagon



3. If your polygons are similar to those given in question 2, all the shapes are cyclic except:
- the equilateral triangle with one vertex at the centre of the circle.
 - the isosceles triangle with one vertex at the centre of the circle.
 - the arrowhead
 - the rhombus
 - the irregular hexagon
 - the pentagon with one vertex at the centre of the circle.
-

2376 Maths in Your Head (SMILE)

No answers required

2377 TenSprint(SfW)

You may have played the game against the clock. Well done if you managed to run the 200m race in less than 3 minutes.

If the five dice showed these numbers, you could make 6 lots of 10.

2378 Matching Fractions(SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2379 Ordering Fractions (SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2380 NumberLines (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLine Certificate.

2381 NumberLinesD (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLineD Certificate.

SMILE
Answers

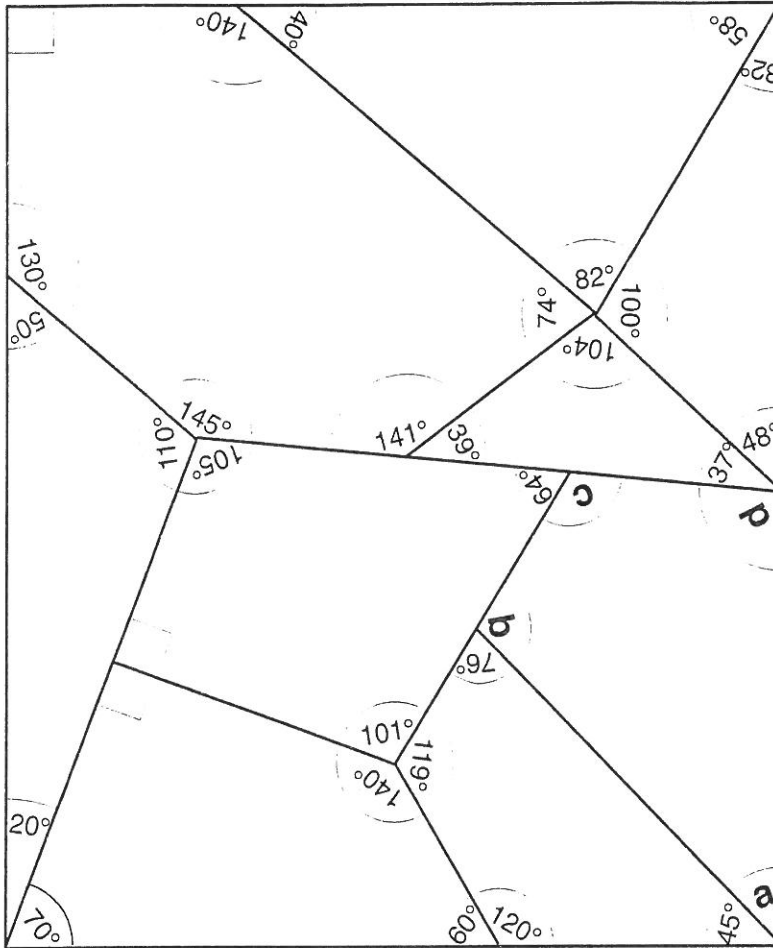
2358

to

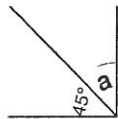
2381

2358 Angle Fit

1. Here is the completed rectangle.

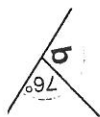


2. $45^\circ + a = 90^\circ$
 $a = 45^\circ$



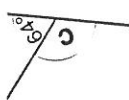
Angles in a rectangle.

$76^\circ + b = 180^\circ$
 $b = 104^\circ$



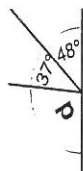
Angles on a straight line add up to 180° .

$64^\circ + c = 180^\circ$
 $c = 116^\circ$



Angles on a straight line add up to 180° .

$48^\circ + 37^\circ + d = 95^\circ$
 $d = 95^\circ$



Angles on a straight line add up to 180° .

2359 Approximate Solutions

1. An approximate solution to 46×17 is 1000. ($50 \times 20 = 1000$)

2.

calculations	rough calculations	rough answers
$583 \div 18$	$600 \div 20$	30
408×68	400×70	28000
$875 \div 23$	$900 \div 20$	45
79×22	80×20	1600
$576 \div 27$	$600 \div 30$	20
67×81	70×80	5600

3.

calculations	rough calculations (approximations)	rough answers (approximate solutions)
71×88	70×90	6300
$383 \div 53$	$400 \div 50$	8
49×48	50×50	2500

4. a) 1170×42 and 1200×40 must be wrong.
 b) $1100 \div 50$ and $1200 \div 40$ would give approximate solutions.
 c) $1200 \div 40$ would give a closer approximation.

5.

	calculations	approximations	approximate solutions
a)	36×12	40×10	400
b)	$1796 \div 62$	$1800 \div 60$	30
c)	1950×11	2000×10	20000
d)	$1950 \div 205$	$2000 \div 200$	10

6. Approximately £10000.

calculations	approximations	approximate solutions
214×52	200×50	10000

7. Approximately 900 centicubes.

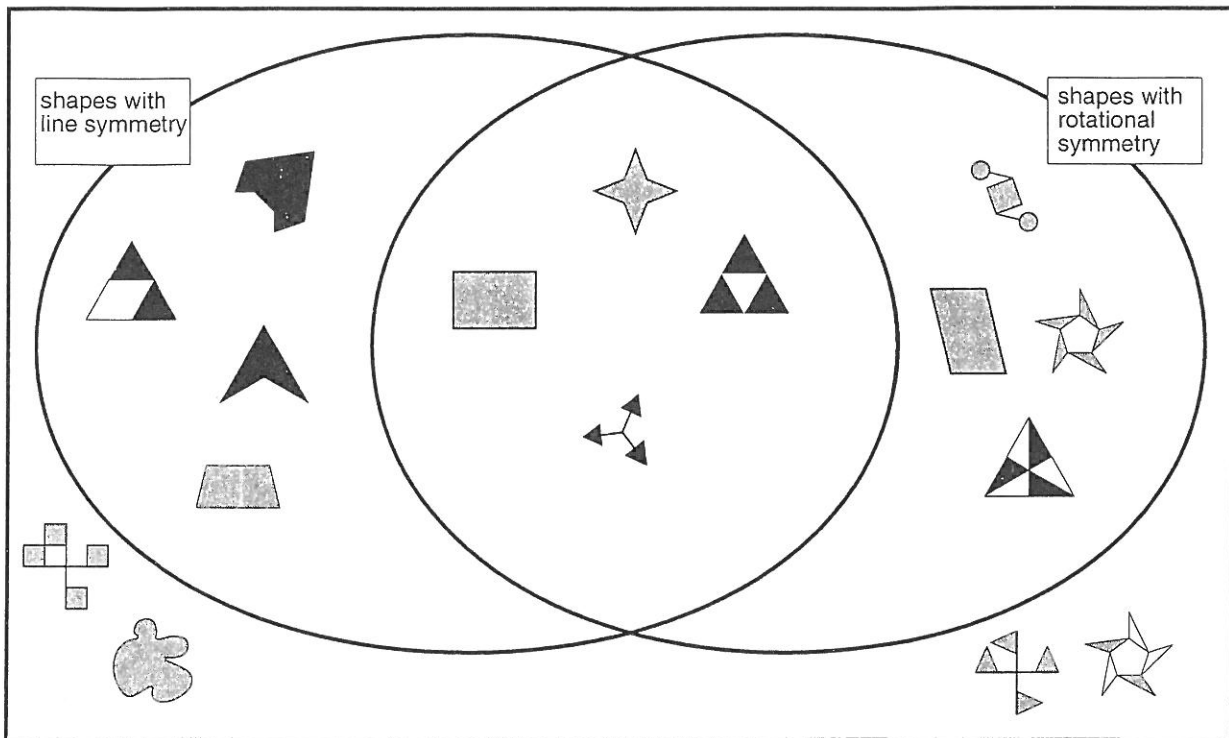
calculations	approximations	approximate solutions
27×29	30×30	900

8. Approximately 25 pints of milk.

calculations	approximations	approximate solutions
$485 \div 22$	$500 \div 20$	25

2360 Rotational and Line Symmetry Review

Your completed Venn diagram should have the following shapes in the correct region.



3. You should have drawn one shape in each region.
Check with your teacher that your shapes are in the correct region.

2361 Right-angle or not?

2.

Angle	Right-angle
A	Yes
B	No
C	No
D	Yes
E	Yes
F	No
G	No
H	Yes
I	No
J	No
K	Yes
L	No

3. Get your teacher to check that you have drawn a right-angle properly.

continued/



2361 Right-angle or not? (cont)

4. You could have mentioned:

- the corner of a book
- the corner of the white board
- the corner of a cupboard
- the corner of the filing cabinet ...

Ask your teacher to check.

2362 Decimal Routes

								
$0.2 + 1.3$ = 1.5	0.3×10 = 3	2×1.5 = 3	$7 \div 4$	1.5×2 3	$0.7 + 0.8$ = 1.5	$3 \div 2$ = 1.5	$1 + 2.5$	1.3×10
$15 \div 10$ = 1.5	$4 - 0.5$	$7 - 5.5$ = 1.5	$18 \div 5$	$0.5 + 1.5$	1.4×11	$4.5 - 1.5$ = 3	$1 \div 2$	$1 + 0.05$
$1.1 + 0.4$ = 1.5	$2.5 - 1$ = 1.5	$4.5 \div 3$ = 1.5	$0.5 + 1$ = 1.5	$10 - 8.5$ = 1.5	$16 \div 10$	3×0.5 = 1.5	$0.5 + 0.6$	$1 + 5$
$1.8 - 0.4$	$1.8 - 0.3$ = 1.5	$5.2 \div 2$	$6 + 3.3$	0.5×6 = 3	$7.5 \div 5$ = 1.5	$1.6 - 0.1$ = 1.5	0.5×10	3×0.1
0.4×10	$2.3 + 0.7$ = 3	$6.5 - 5$ = 1.5	0.2×1.5	$1.4 + 1.4$	3×1.5	$1 \div 5$	$5 \div 10$	3×0.5
$6.3 - 3$	$5.3 - 2$	0.75×2 = 1.5	1×0.3	$1.6 + 1.3$	$1.5 + 2.5$	0.2×1.5	$7 \div 5$	$0.2 \div 4$
$3 \div 0.5$	$6.5 \div 4$	12×0.25 = 3	$4 \div 3$	$0.1 - 1.5$	$3.5 - 0.1$	$1.3 + 1.2$	$6 \div 0.5$	$4 - 3$
$3.5 \div 2$	$5 + 4$	$30 \div 20$ = 1.5	$0.6 + 0.9$ = 1.5	$30 \div 10$ = 3	$11.5 \div 10$	6×0.2	$7.1 - 3.1$	$3 \div 4$
								

2363 Conversion Pack 1

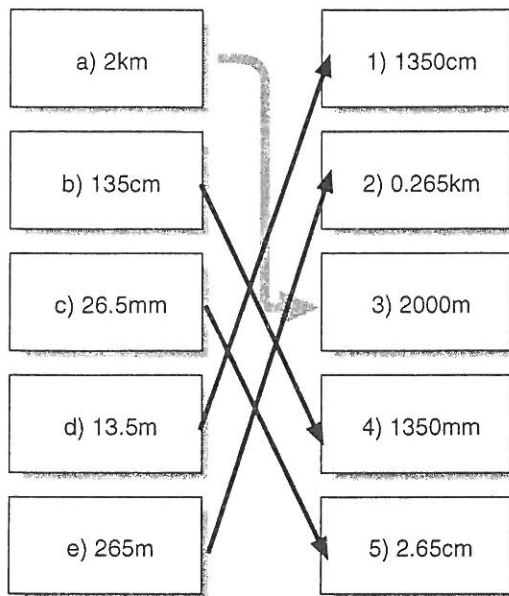
Card A

- 1 gallon = 8 pints
- 25 gallons = (8 x 25) pints
- 25 gallons = 200 pints

continued/

2363 Conversion Pack 1 (cont)

Card B



Card C

1 stone = 14lb

9 stone = (9 x 14)lb

9 stone = 126lb

Liz's weight is 9 stone 7lb = 126lb + 7lb = 134lb

Sam's weight is 160lb

Sam is heavier.

Card D

1ft = 12 inches

4ft = (4 x 12) inches

4ft = 48 inches

4ft 5 inches = (48 + 5) inches

The rug is 53 inches long.

Card E

1 litre = 1000ml

1000ml - 57ml = 943ml

There will be 943 millilitres left in the beaker.

Card F

1kg = 1000g

5kg = (5 x 1000)g

5kg = 5000g

Contents of Tim's bag

Camera	900g
Water (1.2 x 1000)	1200g
Book	350g
Crisps	75g
Wash Bag (1.4 x 1000)	1400g
Travel guide	600g

Total weight of Tim's bag = 4525g (4.525kg)

Tim's bag is not too heavy.

2364 Decimal Playing Cards (SMILE)

This pack contains 52 cards which represent 13 different decimals, 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0, each in 4 ways.

- decimal written as a number
- decimal written in words
- square representation of a decimal
- a number line representing a decimal

You can use the playing cards with a number of SMILE activities, but inside the pack there are some suggested games for you to play.

2365 Higher Decimal Win

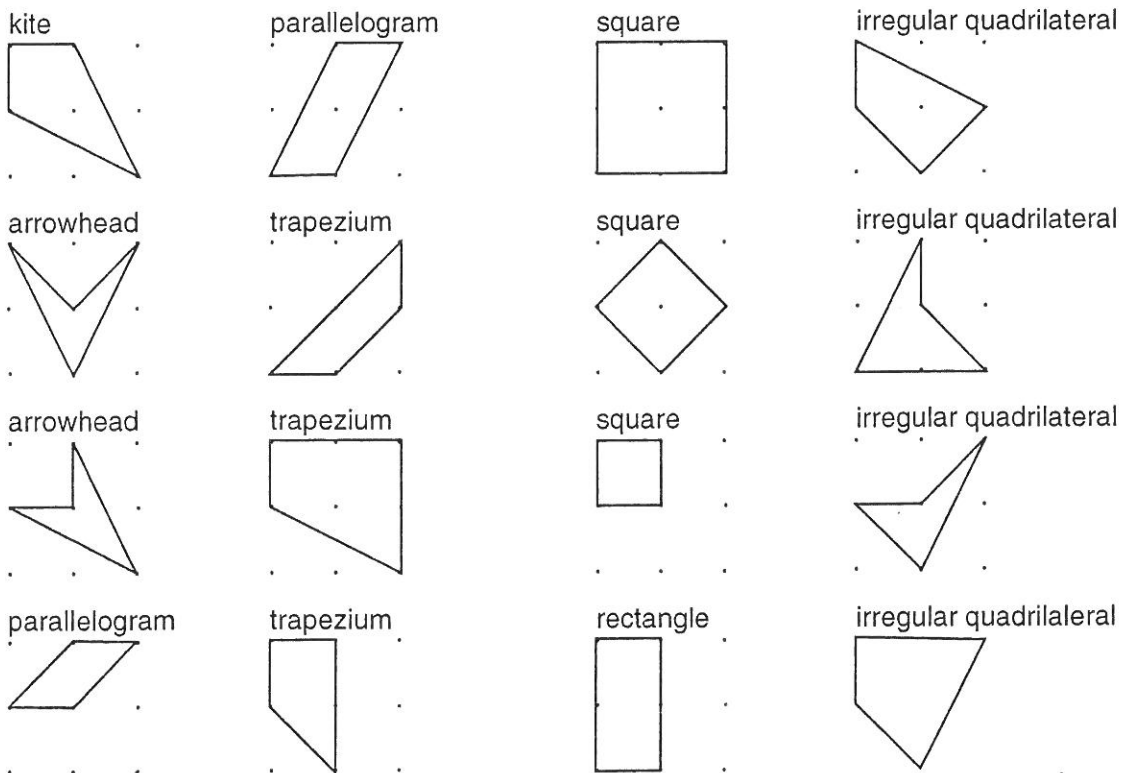
You should find that the best cards to turn over are: 0.62, 0.7, 0.75, 0.8, 0.92, 1.0.

2366 Decimal Difference

You should show your results to your teacher.

2367 Sixteen Quadrilaterals

1. These are the shapes you should have found.

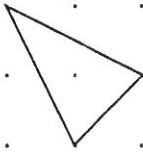


continued/

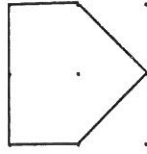
2367 Sixteen Quadrilaterals (cont)

2. It is also possible to find triangles, pentagons, hexagons and heptagons on a 9 point grid.

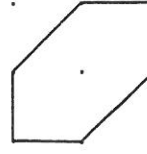
e.g. triangle



pentagon



hexagon



heptagon

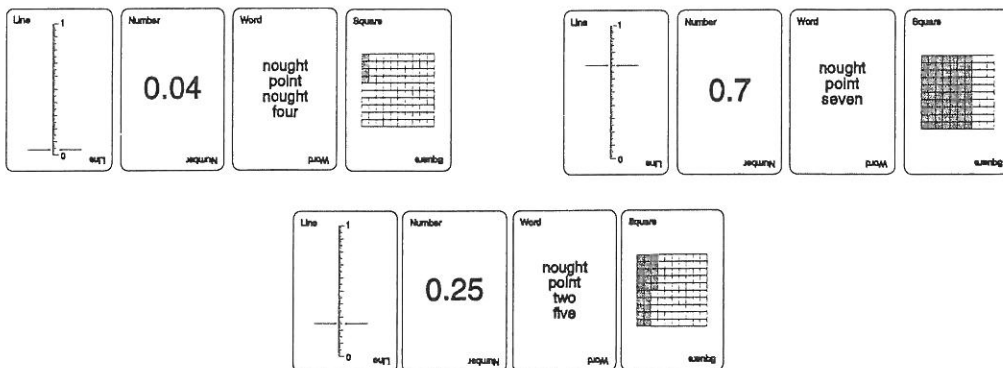


2368 Matching Decimals

- 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0
- 0.8 is larger.
- 0.65 is smaller.
- 0.8 is the largest.
- You could have written the following decimals which are used on the cards.
0.62, 0.7, 0.75 If you have written a different decimal, check your answer with your teacher.
- Some possible answers are:
0.36, 0.37, 0.38, 0.39.
If your decimal is different, check your answer with your teacher.

2369 Decimal Sort

2. Here are examples of three different decimal 'set's.



3. Show your completed sets to your teacher.

2370 Conversion Pack 2

Card A **1 gallon \approx 4.5 litres**

£0.59 per litre 1 gallon costs $(£0.59 \times 4.5) = £2.655 = £2.66$
£0.59 per litre is cheaper than £2.80 per gallon.

Card B **1 litre \approx 1.75 pints**

1.5 litres $\approx (1.5 \times 1.75)$ pints ≈ 2.625 pints
The 1.5 litre bottle contains most liquid.

Card C **1 yard = 3ft = (3 x 12) inches** **1 inch \approx 2.5cm**
1 yard = 36 inches 36 inches $\approx (36 \times 2.5)$ cm

1 yard \approx 90cm
One metre is longer than one yard.

Card D **8km \approx 5 miles**
1km \approx 5/8 miles

Paris = 200km $\approx (200 \times 5/8)$ miles ≈ 125 miles
Lille = 240km $\approx (240 \times 5/8)$ miles ≈ 150 miles

Card E **1kg \approx 2.2lb**

10lb potatoes cost £1.19
1lb potatoes costs $(£1.19 \div 10) = £0.119$

1kg \approx 2.2lb potatoes cost $(2.2 \times £0.119) = £0.2618$
5kg cost $(5 \times £0.2618) = £1.309$
A 5kg bag of potatoes should cost £1.31

Card F **1kg = 1000g \approx 2.2lb** **1lb = 16oz**

1lb $\approx (1000 \div 2.2)$ g ≈ 454.54 g
1oz $\approx (454.54 \div 16)$ g ≈ 28.409 g
6oz ≈ 170.45 g

240g is enough cottage cheese for the mackerel pate.

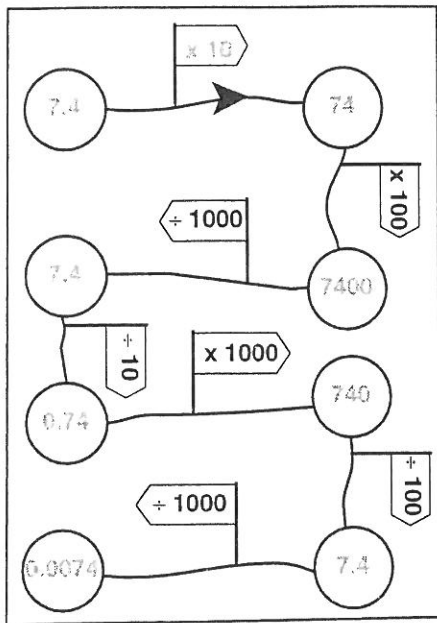
2371 Rounding to 10

1. a) 60 b) 30 c) 50 d) 10
 e) 80 f) 60 g) 10 h) 100

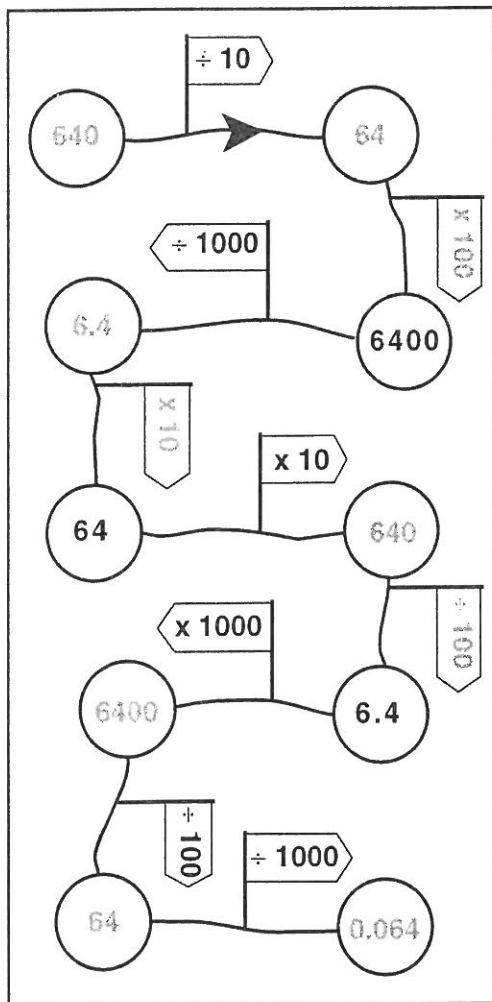
2. Play the game sufficient times until you can quickly round each number to the nearest 10.
-

2372 Powers of Ten Flags

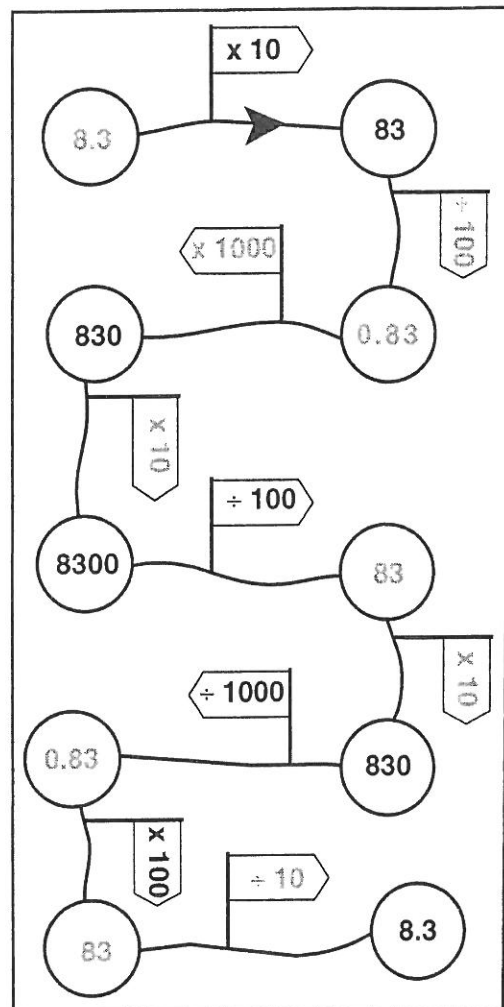
1.



2.



3.



2373 Queens (Micro/SfW)

Queens

Here is one arrangement of 5 Queens on an 8 by 8 chessboard, so that the Queens are protecting every square. Your arrangement may be a reflection of the one shown.

*							
						*	
	*						
							*
			*				

Avoiding Each Other

Here is one arrangement of 8 Queens on an 8 x 8 chessboard so that no two Queens are in line with each other. Your arrangement may be a reflection of the one shown.

						*	
	*						
					*		
		*					
*							
			*				
							*
				*			

Investigating Queens

On an 8 x 8 board, the largest number of squares which can be protected with just one Queen is 28.

There are many questions that can be asked:

- Can a Queen protect an odd number of squares?
- What is the smallest number of squares a Queen can protect?

Drawing and numbering the board might help you to see patterns and to decide on the best possible position for the Queen.

		26	28				
	24	26					

To find a rule for squares it might help to look at odd and even sized boards, but it may be easier to get a general rule for rectangles which are not square.

2374 Equivalent Fractions Pairs

1. a) Here are two different sets of equivalent fraction pairs.

$$\frac{6}{10} \equiv \frac{3}{5} \qquad \frac{8}{10} \equiv \frac{4}{5}$$

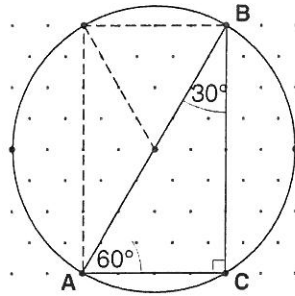
$$\frac{1}{2} \equiv \frac{4}{8} \qquad \text{or} \qquad \frac{2}{3} \equiv \frac{6}{9}$$

You may have found different sets of equivalent fraction pairs. If you are unsure whether your equivalent fraction pairs are correct, check them with your teacher.

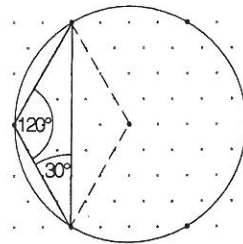
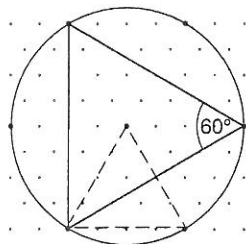
- b) 7 and 9 are not used. or 1 and 7 are not used.
2. a) This is one set of 4 equivalent fraction pairs. You may have used the numbers to create different equivalent fractions.
- b) The numbers not used were:
11, 13, 17 and 19. All prime numbers larger than 10.

2375 Polygons in Circles

1. c) $\angle BAC = 60^\circ$ because isometric paper is created from equilateral triangles.
 $\angle ABC = 30^\circ$ because angles of a triangle add up to 180° .



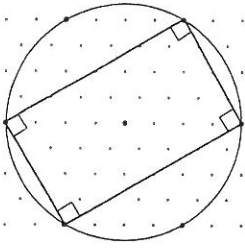
2. a) Equilateral triangle b) Isosceles triangle



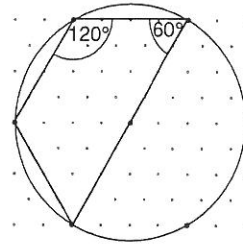
continued/

2375 Polygons in Circles (cont)

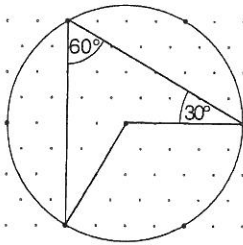
c) A rectangle



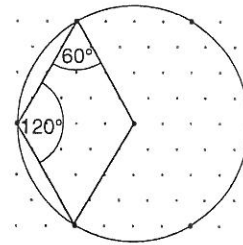
d) A trapezium



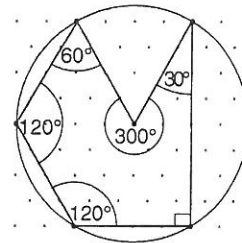
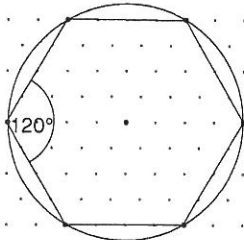
e) An arrowhead



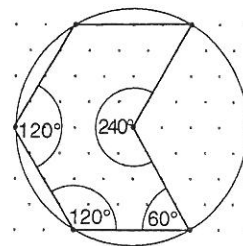
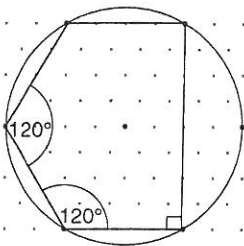
f) A rhombus



g) A hexagon



h) A pentagon



3. If your polygons are similar to those given in question 2, all the shapes are cyclic except:

- the equilateral triangle with one vertex at the centre of the circle.
 - the isosceles triangle with one vertex at the centre of the circle.
 - the arrowhead
 - the rhombus
 - the irregular hexagon
 - the pentagon with one vertex at the centre of the circle.
-

2376 Maths in Your Head (SMILE)

No answers required

2377 TenSprint(SfW)

You may have played the game against the clock. Well done if you managed to run the 200m race in less than 3 minutes.

If the five dice showed these numbers, you could make 6 lots of 10.

2378 Matching Fractions(SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2379 Ordering Fractions (SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2380 NumberLines (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLine Certificate.

2381 NumberLinesD (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLineD Certificate.

SMILE Answers

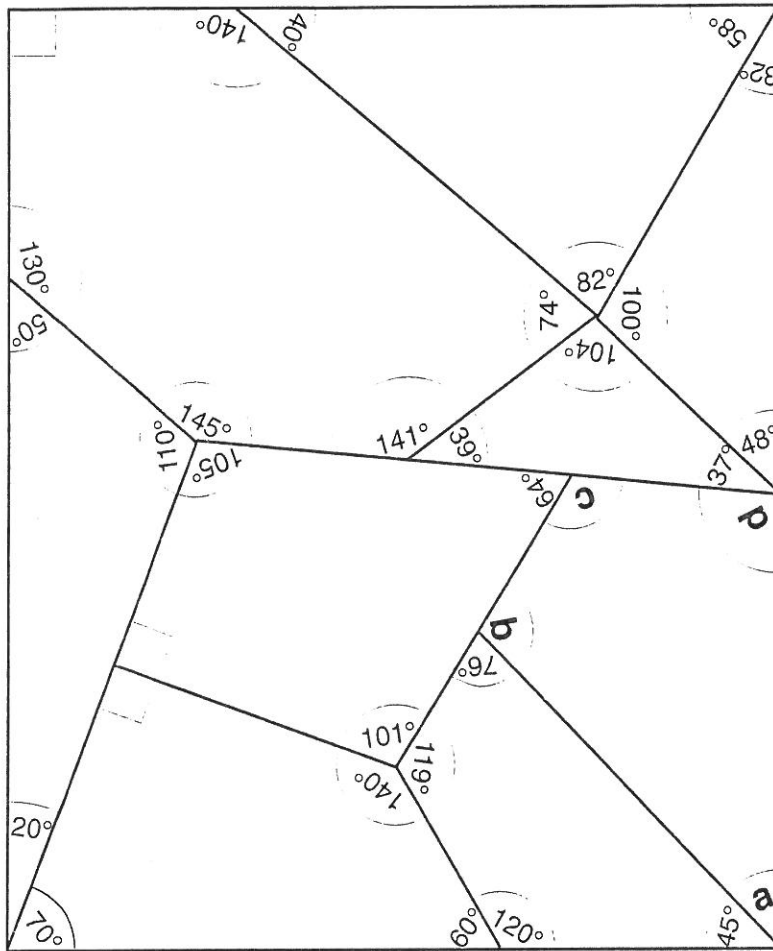
2358

to

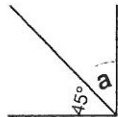
2381

2358 Angle Fit

1. Here is the completed rectangle.

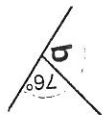


2. $45^\circ + a = 90^\circ$
 $a = 45^\circ$



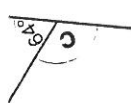
Angles in a rectangle.

$76^\circ + b = 180^\circ$
 $b = 104^\circ$



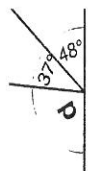
Angles on a straight line add up to 180° .

$64^\circ + c = 180^\circ$
 $c = 116^\circ$



Angles on a straight line add up to 180° .

$48^\circ + 37^\circ + d = 180^\circ$
 $d = 95^\circ$



Angles on a straight line add up to 180° .

2359 Approximate Solutions

1. An approximate solution to 46×17 is 1000. ($50 \times 20 = 1000$)

2.

calculations	rough calculations	rough answers
$583 \div 18$	$600 \div 20$	30
408×68	400×70	28000
$875 \div 23$	$900 \div 20$	45
79×22	80×20	1600
$576 \div 27$	$600 \div 30$	20
67×81	70×80	5600

3.

calculations	rough calculations (approximations)	rough answers (approximate solutions)
71×88	70×90	6300
$383 \div 53$	$400 \div 50$	8
49×48	50×50	2500

4. a) 1170×42 and 1200×40 must be wrong.
 b) $1100 \div 50$ and $1200 \div 40$ would give approximate solutions.
 c) $1200 \div 40$ would give a closer approximation.

5.

	calculations	approximations	approximate solutions
a)	36×12	40×10	400
b)	$1796 \div 62$	$1800 \div 60$	30
c)	1950×11	2000×10	20000
d)	$1950 \div 205$	$2000 \div 200$	10

6. Approximately £10000.

calculations	approximations	approximate solutions
214×52	200×50	10000

7. Approximately 900 centicubes.

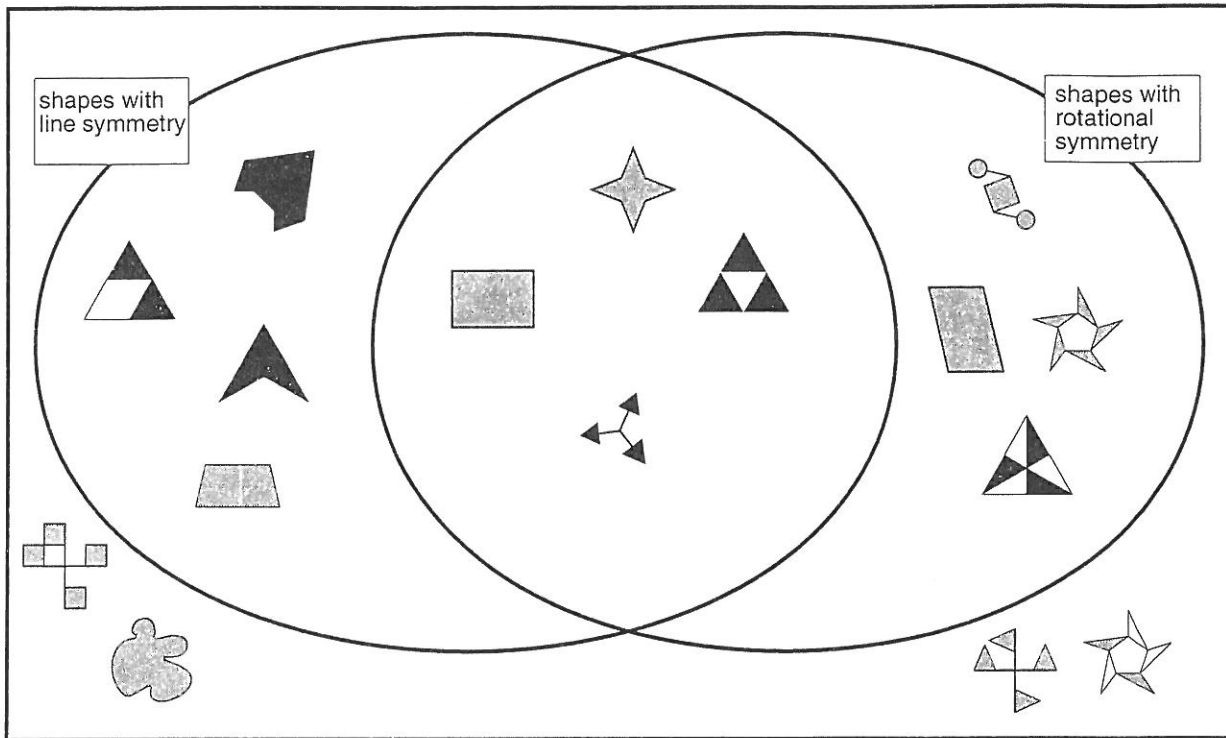
calculations	approximations	approximate solutions
27×29	30×30	900

8. Approximately 25 pints of milk.

calculations	approximations	approximate solutions
$485 \div 22$	$500 \div 20$	25

2360 Rotational and Line Symmetry Review

Your completed Venn diagram should have the following shapes in the correct region.



3. You should have drawn one shape in each region.
Check with your teacher that your shapes are in the correct region.

2361 Right-angle or not?

2.

Angle	Right-angle
A	Yes
B	No
C	No
D	Yes
E	Yes
F	No
G	No
H	Yes
I	No
J	No
K	Yes
L	No

3. Get your teacher to check that you have drawn a right-angle properly.

continued/



2361 Right-angle or not? (cont)

4. You could have mentioned:

- the corner of a book
- the corner of the white board
- the corner of a cupboard
- the corner of the filing cabinet ...

Ask your teacher to check.

2362 Decimal Routes

								
$0.2 + 1.3$ = 1.5	0.3×10 = 3	2×1.5 = 3	$7 \div 4$	1.5×2 3	$0.7 + 0.8$ = 1.5	$3 \div 2$ = 1.5	$1 + 2.5$	1.3×10
$15 \div 10$ = 1.5	$4 - 0.5$	$7 - 5.5$ = 1.5	$18 \div 5$	$0.5 + 1.5$	1.4×11	$4.5 - 1.5$ = 3	$1 \div 2$	$1 + 0.05$
$1.1 + 0.4$ = 1.5	$2.5 - 1$ = 1.5	$4.5 \div 3$ = 1.5	$0.5 + 1$ = 1.5	$10 - 8.5$ = 1.5	$16 \div 10$	3×0.5 = 1.5	$0.5 + 0.6$	$1 + 5$
$1.8 - 0.4$	$1.8 - 0.3$ = 1.5	$5.2 \div 2$	$6 + 3.3$	0.5×6 = 3	$7.5 \div 5$ = 1.5	$1.6 - 0.1$ = 1.5	0.5×10	3×0.1
0.4×10	$2.3 + 0.7$ = 3	$6.5 - 5$ = 1.5	0.2×1.5	$1.4 + 1.4$	3×1.5	$1 \div 5$	$5 \div 10$	3×0.5
$6.3 - 3$	$5.3 - 2$	0.75×2 = 1.5	1×0.3	$1.6 + 1.3$	$1.5 + 2.5$	0.2×1.5	$7 \div 5$	$0.2 \div 4$
$3 \div 0.5$	$6.5 \div 4$	12×0.25 = 3	$4 \div 3$	$0.1 - 1.5$	$3.5 - 0.1$	$1.3 + 1.2$	$6 \div 0.5$	$4 - 3$
$3.5 \div 2$	$5 + 4$	$30 \div 20$ = 1.5	$0.6 + 0.9$ = 1.5	$30 \div 10$ = 3	$11.5 \div 10$	6×0.2	$7.1 - 3.1$	$3 \div 4$
								

2363 Conversion Pack 1

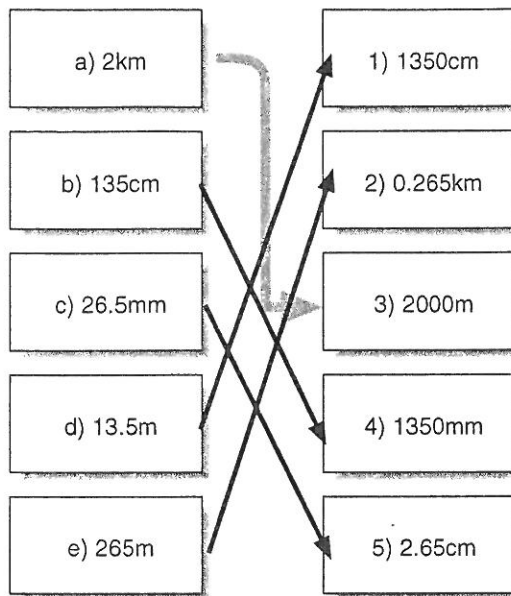
Card A

- 1 gallon = 8 pints
- 25 gallons = (8 x 25) pints
- 25 gallons = 200 pints

continued/

2363 Conversion Pack 1 (cont)

Card B



Card C

1 stone = 14lb

9 stone = (9×14) lb

9 stone = 126lb

Liz's weight is 9 stone 7lb = 126lb + 7lb = 134lb

Sam's weight is 160lb

Sam is heavier.

Card D

1ft = 12 inches

4ft = (4×12) inches

4ft = 48 inches

4ft 5 inches = $(48 + 5)$ inches

The rug is 53 inches long.

Card E

1 litre = 1000ml

$1000\text{ml} - 57\text{ml} = 943\text{ml}$

There will be 943 millilitres left in the beaker.

Card F

1kg = 1000g

5kg = (5×1000) g

5kg = 5000g

Contents of Tim's bag

Camera	900g
Water (1.2×1000)	1200g
Book	350g
Crisps	75g
Wash Bag (1.4×1000)	1400g
Travel guide	600g

Total weight of Tim's bag = 4525g (4.525kg)

Tim's bag is not too heavy.

2364 Decimal Playing Cards (SMILE)

This pack contains 52 cards which represent 13 different decimals, 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0, each in 4 ways.

- decimal written as a number
- decimal written in words
- square representation of a decimal
- a number line representing a decimal

You can use the playing cards with a number of SMILE activities, but inside the pack there are some suggested games for you to play.

2365 Higher Decimal Win

You should find that the best cards to turn over are: 0.62, 0.7, 0.75, 0.8, 0.92, 1.0.

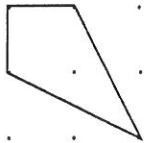
2366 Decimal Difference

You should show your results to your teacher.

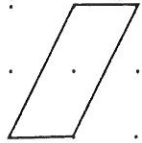
2367 Sixteen Quadrilaterals

1. These are the shapes you should have found.

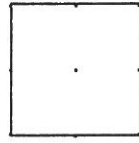
kite



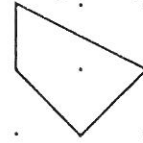
parallelogram



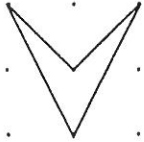
square



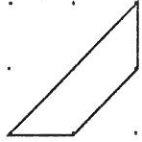
irregular quadrilateral



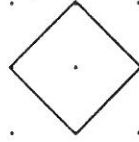
arrowhead



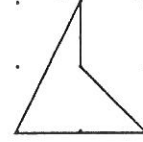
trapezium



square



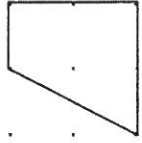
irregular quadrilateral



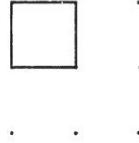
arrowhead



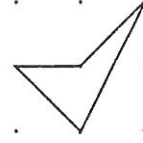
trapezium



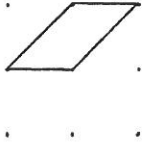
square



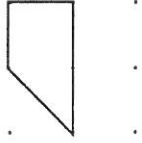
irregular quadrilateral



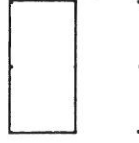
parallelogram



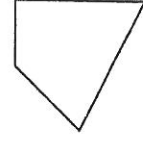
trapezium



rectangle



irregular quadrilateral

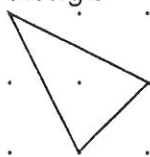


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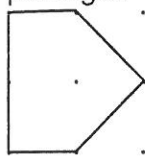
2367 Sixteen Quadrilaterals (cont)

2. It is also possible to find triangles, pentagons, hexagons and heptagons on a 9 point grid.

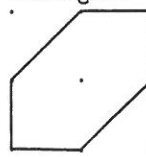
e.g. triangle



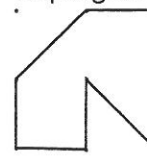
pentagon



hexagon



heptagon

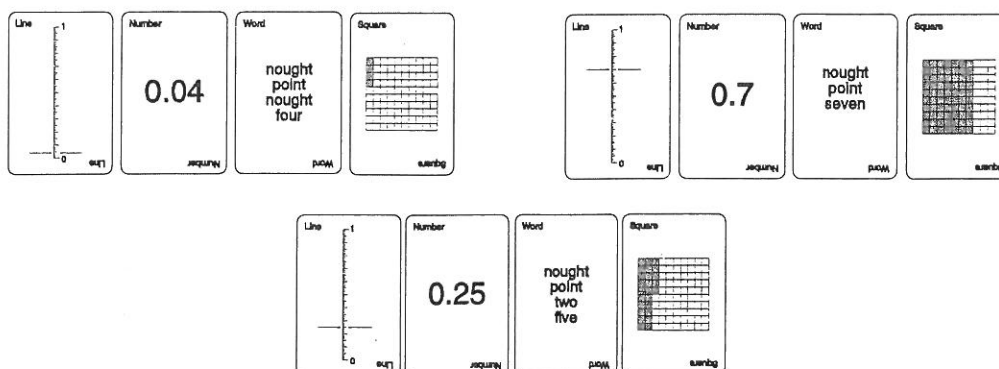


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0.36, 0.37, 0.38, 0.39.
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2. Here are examples of three different decimal 'set's.



3. Show your completed sets to your teacher.

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£0.59 per litre 1 gallon costs $(£0.59 \times 4.5) = £2.655 = £2.66$
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1.5 litres $\approx (1.5 \times 1.75)$ pints ≈ 2.625 pints
The 1.5 litre bottle contains most liquid.

Card C **1 yard = 3ft = (3 x 12) inches** **1 inch \approx 2.5cm**
1 yard = 36 inches 36 inches $\approx (36 \times 2.5)$ cm

1 yard \approx 90cm
One metre is longer than one yard.

Card D **8km \approx 5 miles**
1km \approx 5/8 miles

Paris = 200km $\approx (200 \times 5/8)$ miles ≈ 125 miles
Lille = 240km $\approx (240 \times 5/8)$ miles ≈ 150 miles

Card E **1kg \approx 2.2lb**

10lb potatoes cost £1.19
1lb potatoes costs $(£1.19 \div 10) = £0.119$

1kg \approx 2.2lb potatoes cost $(2.2 \times £0.119) = £0.2618$
5kg cost $(5 \times £0.2618) = £1.309$
A 5kg bag of potatoes should cost £1.31

Card F **1kg = 1000g \approx 2.2lb** **1lb = 16oz**

1lb $\approx (1000 \div 2.2)$ g ≈ 454.54 g
1oz $\approx (454.54 \div 16)$ g ≈ 28.409 g
6oz ≈ 170.45 g

240g is enough cottage cheese for the mackerel pate.

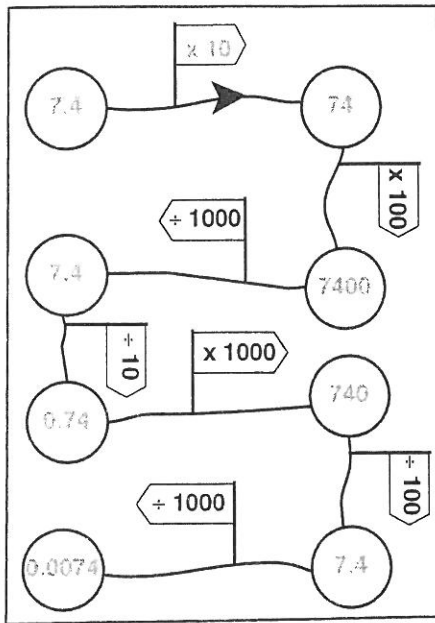
2371 Rounding to 10

1. a) 60 b) 30 c) 50 d) 10
 e) 80 f) 60 g) 10 h) 100

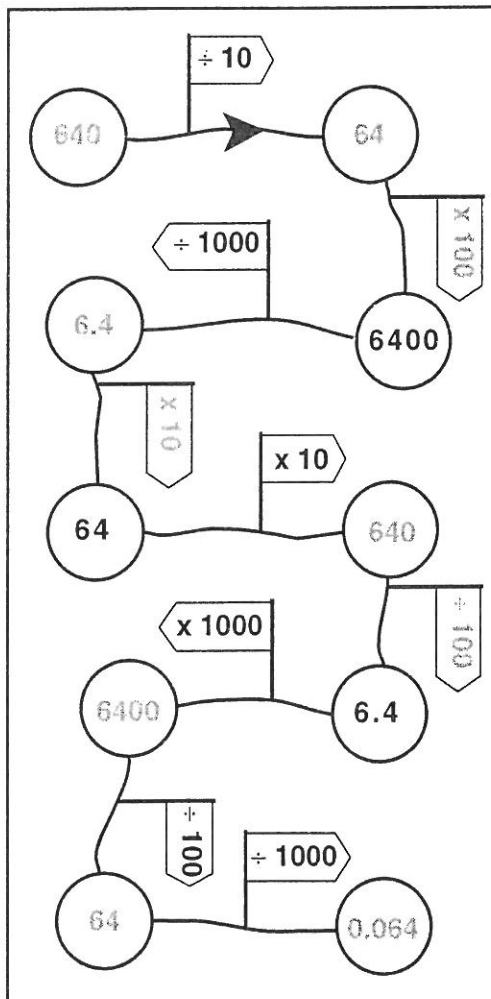
2. Play the game sufficient times until you can quickly round each number to the nearest 10.
-

2372 Powers of Ten Flags

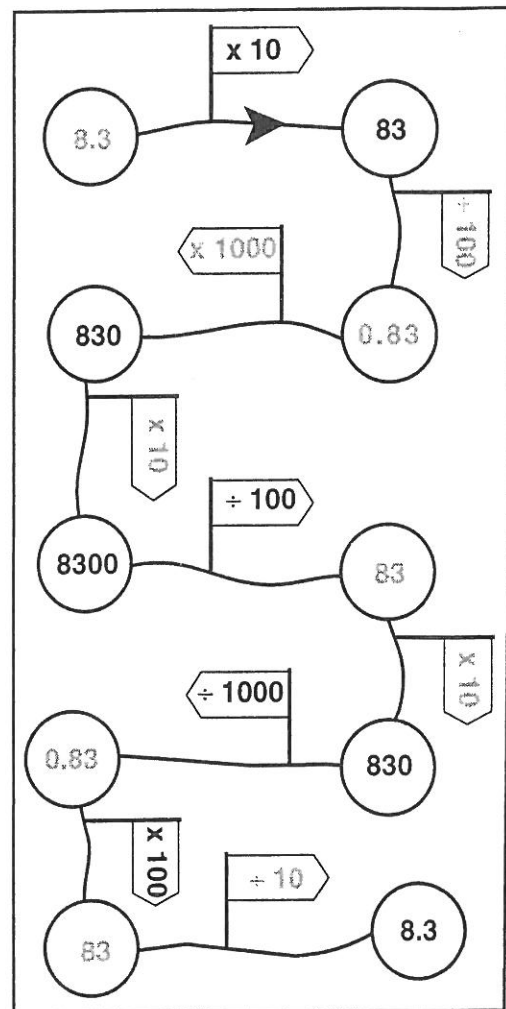
1.



2.



3.



2373 Queens (Micro/SfW)

Queens

Here is one arrangement of 5 Queens on an 8 by 8 chessboard, so that the Queens are protecting every square. Your arrangement may be a reflection of the one shown.

*							
						*	
	*						
							*
			*				

Avoiding Each Other

Here is one arrangement of 8 Queens on an 8 x 8 chessboard so that no two Queens are in line with each other. Your arrangement may be a reflection of the one shown.

						*	
	*						
					*		
		*					
*							
			*				
							*
				*			

Investigating Queens

On an 8 x 8 board, the largest number of squares which can be protected with just one Queen is 28.

There are many questions that can be asked:

- Can a Queen protect an odd number of squares?
- What is the smallest number of squares a Queen can protect?

Drawing and numbering the board might help you to see patterns and to decide on the best possible position for the Queen.

		26	28				
	24	26					

To find a rule for squares it might help to look at odd and even sized boards, but it may be easier to get a general rule for rectangles which are not square.

2374 Equivalent Fractions Pairs

1. a) Here are two different sets of equivalent fraction pairs.

$$\frac{6}{10} \equiv \frac{3}{5} \qquad \frac{8}{10} \equiv \frac{4}{5}$$

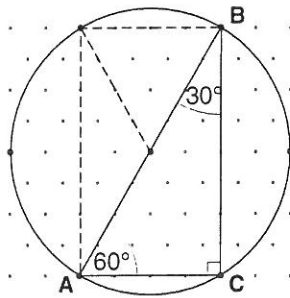
$$\frac{1}{2} \equiv \frac{4}{8} \qquad \text{or} \qquad \frac{2}{3} \equiv \frac{6}{9}$$

You may have found different sets of equivalent fraction pairs. If you are unsure whether your equivalent fraction pairs are correct, check them with your teacher.

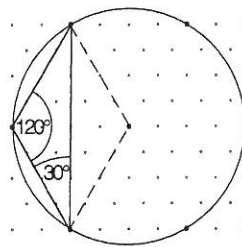
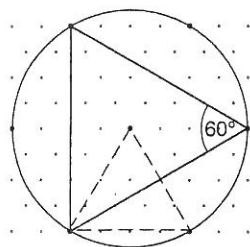
- b) 7 and 9 are not used. or 1 and 7 are not used.
2. a) This is one set of 4 equivalent fraction pairs. You may have used the numbers to create different equivalent fractions.
- b) The numbers not used were:
11, 13, 17 and 19. All prime numbers larger than 10.

2375 Polygons in Circles

1. c) $\angle BAC = 60^\circ$ because isometric paper is created from equilateral triangles.
 $\angle ABC = 30^\circ$ because angles of a triangle add up to 180° .



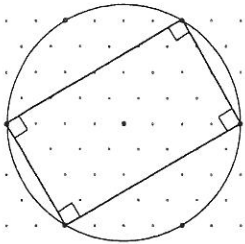
2. a) Equilateral triangle b) Isosceles triangle



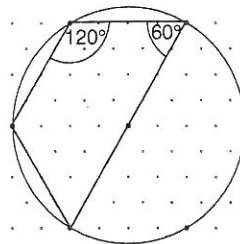
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2375 Polygons in Circles (cont)

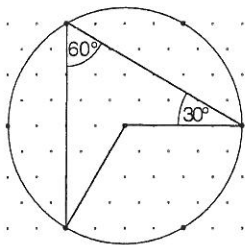
c) A rectangle



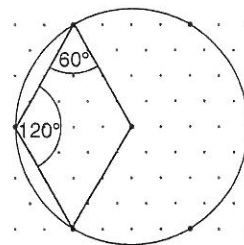
d) A trapezium



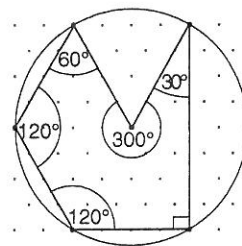
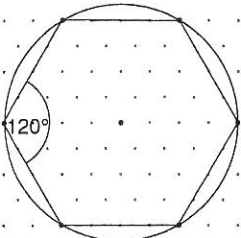
e) An arrowhead



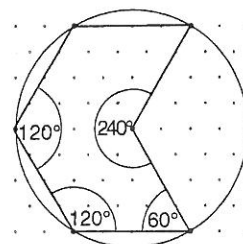
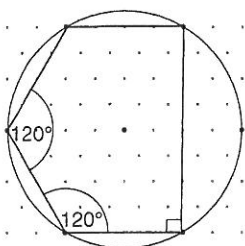
f) A rhombus



g) A hexagon



h) A pentagon



3. If your polygons are similar to those given in question 2, all the shapes are cyclic except:

- the equilateral triangle with one vertex at the centre of the circle.
- the isosceles triangle with one vertex at the centre of the circle.
- the arrowhead
- the rhombus
- the irregular hexagon
- the pentagon with one vertex at the centre of the circle.

2376 Maths in Your Head (SMILE)

No answers required

2377 TenSprint(SfW)

You may have played the game against the clock. Well done if you managed to run the 200m race in less than 3 minutes.

If the five dice showed these numbers, you could make 6 lots of 10.

2378 Matching Fractions(SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2379 Ordering Fractions (SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2380 NumberLines (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLine Certificate.

2381 NumberLinesD (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLineD Certificate.

SMILE Answers

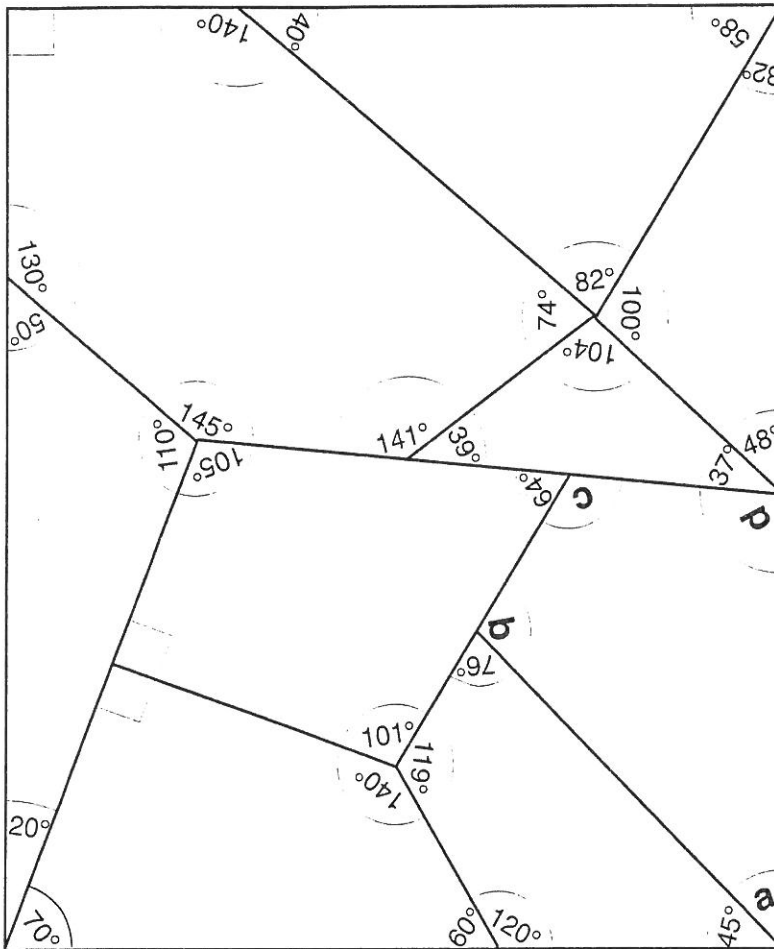
2358

to

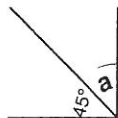
2381

2358 Angle Fit

1. Here is the completed rectangle.



2. $45^\circ + a = 90^\circ$
 $a = 45^\circ$



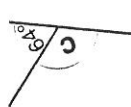
Angles in a rectangle.

$76^\circ + b = 180^\circ$
 $b = 104^\circ$



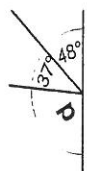
Angles on a straight line add up to 180°.

$64^\circ + c = 180^\circ$
 $c = 116^\circ$



Angles on a straight line add up to 180°.

$48^\circ + 37^\circ + d = 95^\circ$
 $d = 95^\circ$



Angles on a straight line add up to 180°.

2359 Approximate Solutions

1. An approximate solution to 46×17 is 1000. ($50 \times 20 = 1000$)

2.

calculations	rough calculations	rough answers
$583 \div 18$	$600 \div 20$	30
408×68	400×70	28000
$875 \div 23$	$900 \div 20$	45
79×22	80×20	1600
$576 \div 27$	$600 \div 30$	20
67×81	70×80	5600

3.

calculations	rough calculations (approximations)	rough answers (approximate solutions)
71×88	70×90	6300
$383 \div 53$	$400 \div 50$	8
49×48	50×50	2500

4. a) 1170×42 and 1200×40 must be wrong.
 b) $1100 \div 50$ and $1200 \div 40$ would give approximate solutions.
 c) $1200 \div 40$ would give a closer approximation.

5.

	calculations	approximations	approximate solutions
a)	36×12	40×10	400
b)	$1796 \div 62$	$1800 \div 60$	30
c)	1950×11	2000×10	20000
d)	$1950 \div 205$	$2000 \div 200$	10

6. Approximately £10000.

calculations	approximations	approximate solutions
214×52	200×50	10000

7. Approximately 900 centicubes.

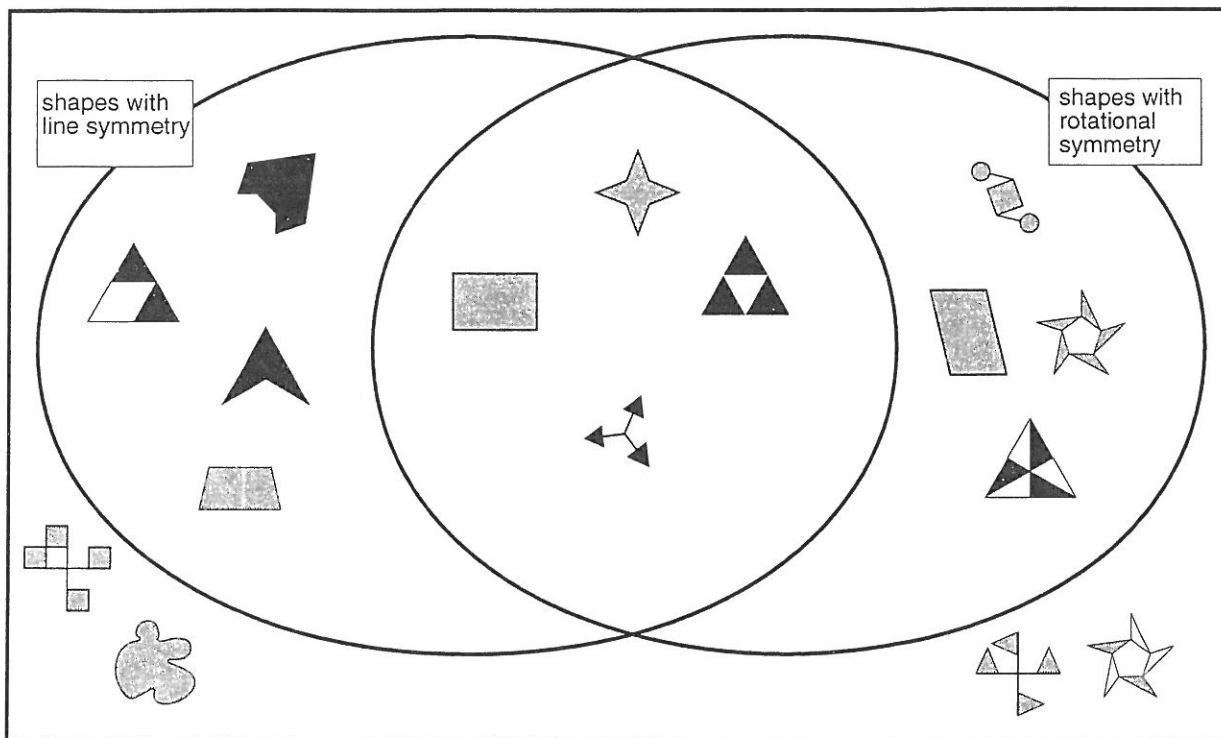
calculations	approximations	approximate solutions
27×29	30×30	900

8. Approximately 25 pints of milk.

calculations	approximations	approximate solutions
$485 \div 22$	$500 \div 20$	25

2360 Rotational and Line Symmetry Review

Your completed Venn diagram should have the following shapes in the correct region.



3. You should have drawn one shape in each region.
Check with your teacher that your shapes are in the correct region.

2361 Right-angle or not?

2.

Angle	Right-angle
A	Yes
B	No
C	No
D	Yes
E	Yes
F	No
G	No
H	Yes
I	No
J	No
K	Yes
L	No

3. Get your teacher to check that you have drawn a right-angle properly.

continued/


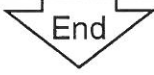
2361 Right-angle or not? (cont)

4. You could have mentioned:

- the corner of a book
- the corner of the white board
- the corner of a cupboard
- the corner of the filing cabinet ...

Ask your teacher to check.

2362 Decimal Routes

								
$0.2 + 1.3$ = 1.5	0.3×10 = 3	2×1.5 = 3	$7 \div 4$	1.5×2 3	$0.7 + 0.8$ = 1.5	$3 \div 2$ = 1.5	$1 + 2.5$	1.3×10
$15 \div 10$ = 1.5	$4 - 0.5$	$7 - 5.5$ = 1.5	$18 \div 5$	$0.5 + 1.5$	1.4×11	$4.5 - 1.5$ = 3	$1 \div 2$	$1 + 0.05$
$1.1 + 0.4$ = 1.5	$2.5 - 1$ = 1.5	$4.5 \div 3$ = 1.5	$0.5 + 1$ = 1.5	$10 - 8.5$ = 1.5	$16 \div 10$	3×0.5 = 1.5	$0.5 + 0.6$	$1 + 5$
$1.8 - 0.4$	$1.8 - 0.3$ = 1.5	$5.2 \div 2$	$6 + 3.3$	0.5×6 = 3	$7.5 \div 5$ = 1.5	$1.6 - 0.1$ = 1.5	0.5×10	3×0.1
0.4×10	$2.3 + 0.7$ = 3	$6.5 - 5$ = 1.5	0.2×1.5	$1.4 + 1.4$	3×1.5	$1 \div 5$	$5 \div 10$	3×0.5
$6.3 - 3$	$5.3 - 2$	0.75×2 = 1.5	1×0.3	$1.6 + 1.3$	$1.5 + 2.5$	0.2×1.5	$7 \div 5$	$0.2 \div 4$
$3 \div 0.5$	$6.5 \div 4$	12×0.25 = 3	$4 \div 3$	$0.1 - 1.5$	$3.5 - 0.1$	$1.3 + 1.2$	$6 \div 0.5$	$4 - 3$
$3.5 \div 2$	$5 + 4$	$30 \div 20$ = 1.5	$0.6 + 0.9$ = 1.5	$30 \div 10$ = 3	$11.5 \div 10$	6×0.2	$7.1 - 3.1$	$3 \div 4$
								

2363 Conversion Pack 1

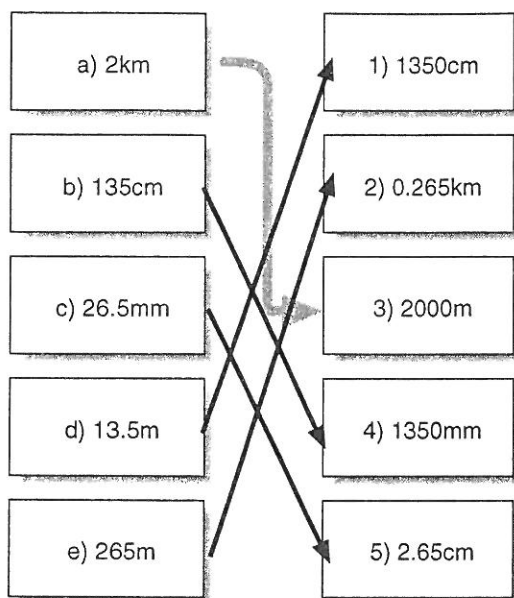
Card A

- 1 gallon = 8 pints
- 25 gallons = (8 x 25) pints
- 25 gallons = 200 pints

continued/

2363 Conversion Pack 1 (cont)

Card B



Card C

1 stone = 14lb

9 stone = (9 x 14)lb

9 stone = 126lb

Liz's weight is 9 stone 7lb = 126lb + 7lb = 134lb

Sam's weight is 160lb

Sam is heavier.

Card D

1ft = 12 inches

4ft = (4 x 12) inches

4ft = 48 inches

4ft 5 inches = (48 + 5) inches

The rug is 53 inches long.

Card E

1 litre = 1000ml

1000ml - 57ml = 943ml

There will be 943 millilitres left in the beaker.

Card F

1kg = 1000g

5kg = (5 x 1000)g

5kg = 5000g

Contents of Tim's bag

Camera	900g
Water (1.2 x 1000)	1200g
Book	350g
Crisps	75g
Wash Bag (1.4 x 1000)	1400g
Travel guide	600g

Total weight of Tim's bag = 4525g (4.525kg)

Tim's bag is not too heavy.

2364 Decimal Playing Cards (SMILE)

This pack contains 52 cards which represent 13 different decimals, 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0, each in 4 ways.

- decimal written as a number
- decimal written in words
- square representation of a decimal
- a number line representing a decimal

You can use the playing cards with a number of SMILE activities, but inside the pack there are some suggested games for you to play.

2365 Higher Decimal Win

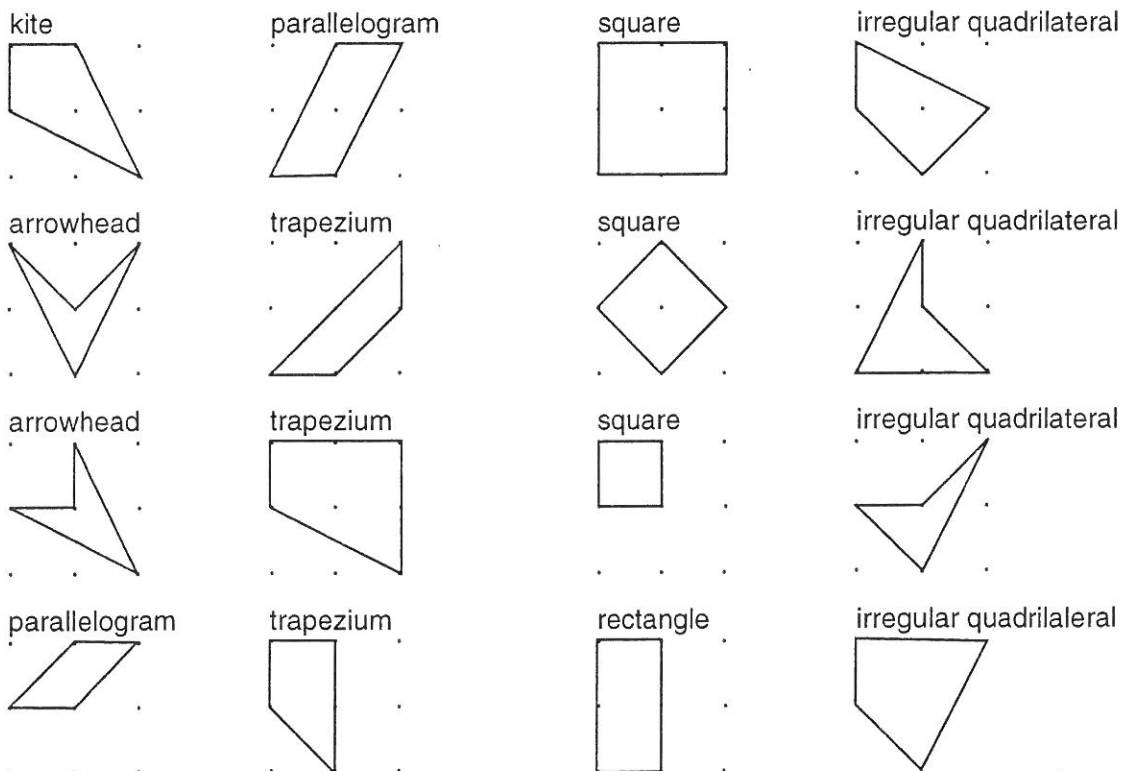
You should find that the best cards to turn over are: 0.62, 0.7, 0.75, 0.8, 0.92, 1.0.

2366 Decimal Difference

You should show your results to your teacher.

2367 Sixteen Quadrilaterals

1. These are the shapes you should have found.

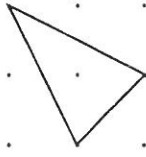


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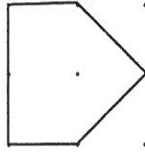
2367 Sixteen Quadrilaterals (cont)

2. It is also possible to find triangles, pentagons, hexagons and heptagons on a 9 point grid.

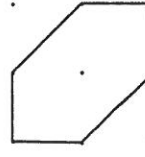
e.g. triangle



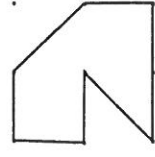
pentagon



hexagon



heptagon

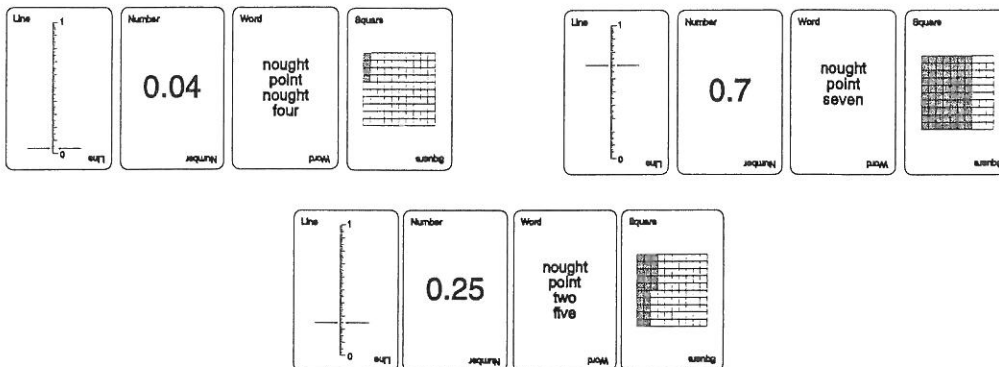


2368 Matching Decimals

- 0.04, 0.08, 0.1, 0.16, 0.25, 0.4, 0.5, 0.62, 0.7, 0.75, 0.8, 0.92, 1.0
- 0.8 is larger.
- 0.65 is smaller.
- 0.8 is the largest.
- You could have written the following decimals which are used on the cards.
0.62, 0.7, 0.75 If you have written a different decimal, check your answer with your teacher.
- Some possible answers are:
0.36, 0.37, 0.38, 0.39.
If your decimal is different, check your answer with your teacher.

2369 Decimal Sort

2. Here are examples of three different decimal 'set's.



3. Show your completed sets to your teacher.

2370 Conversion Pack 2

Card A **1 gallon \approx 4.5 litres**

£0.59 per litre 1 gallon costs $(£0.59 \times 4.5) = £2.655 = £2.66$
£0.59 per litre is cheaper than £2.80 per gallon.

Card B **1 litre \approx 1.75 pints**

1.5 litres $\approx (1.5 \times 1.75)$ pints ≈ 2.625 pints
The 1.5 litre bottle contains most liquid.

Card C **1 yard = 3ft = (3 x 12) inches** **1 inch \approx 2.5cm**
1 yard = 36 inches 36 inches $\approx (36 \times 2.5)$ cm

1 yard \approx 90cm
One metre is longer than one yard.

Card D **8km \approx 5 miles**
1km \approx 5/8 miles

Paris = 200km $\approx (200 \times 5/8)$ miles ≈ 125 miles
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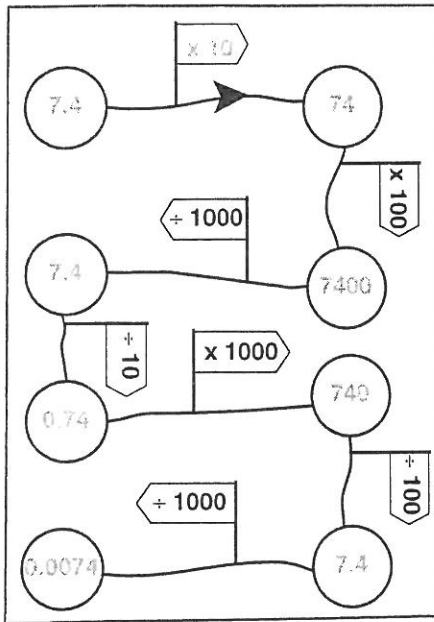
2371 Rounding to 10

1. a) 60 b) 30 c) 50 d) 10
 e) 80 f) 60 g) 10 h) 100

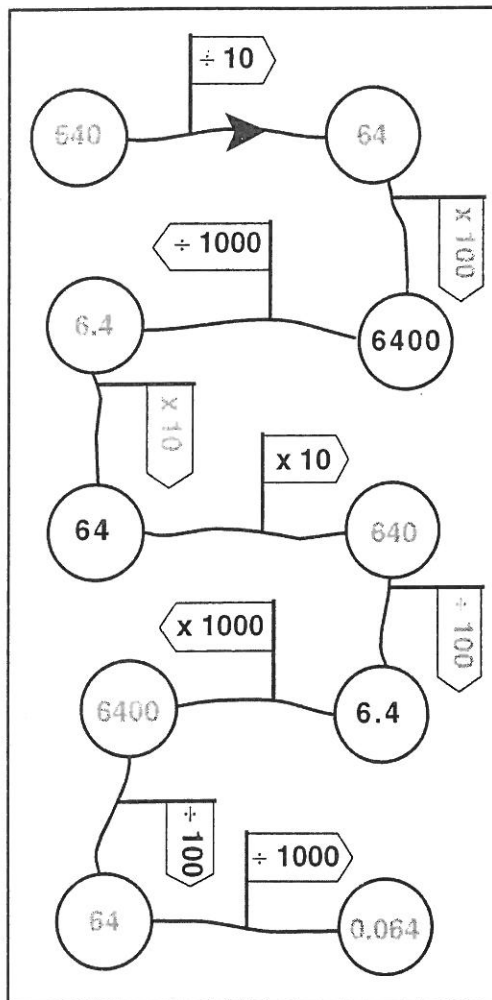
2. Play the game sufficient times until you can quickly round each number to the nearest 10.
-

2372 Powers of Ten Flags

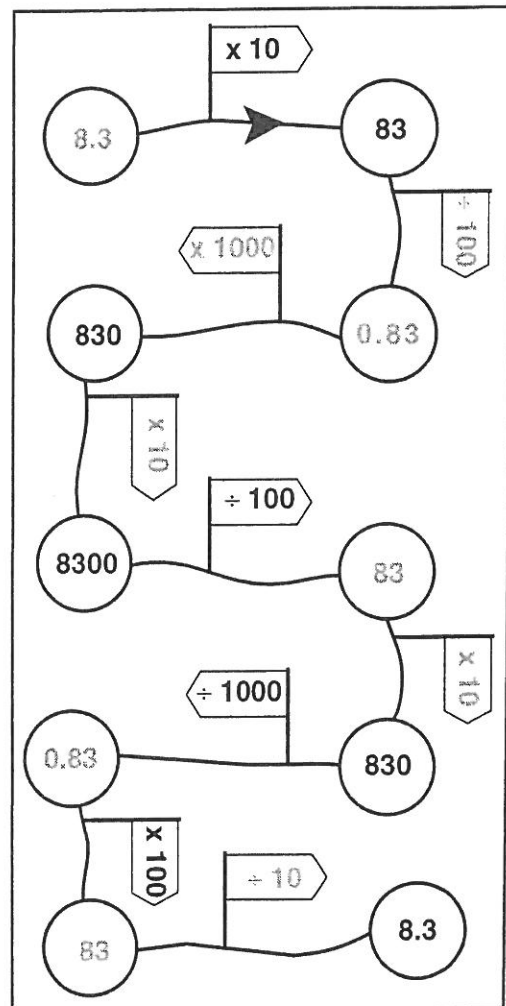
1.



2.



3.



2373 Queens (Micro/SfW)

Queens

Here is one arrangement of 5 Queens on an 8 by 8 chessboard, so that the Queens are protecting every square. Your arrangement may be a reflection of the one shown.

*							
						*	
	*						
							*
			*				

Avoiding Each Other

Here is one arrangement of 8 Queens on an 8 x 8 chessboard so that no two Queens are in line with each other. Your arrangement may be a reflection of the one shown.

						*	
	*						
				*			
*							
			*				
							*
				*			

Investigating Queens

On an 8 x 8 board, the largest number of squares which can be protected with just one Queen is 28.

There are many questions that can be asked:

- Can a Queen protect an odd number of squares?
- What is the smallest number of squares a Queen can protect?

Drawing and numbering the board might help you to see patterns and to decide on the best possible position for the Queen.

			26	28			
		24	26				

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$$\frac{6}{10} \equiv \frac{3}{5}$$

$$\frac{8}{10} \equiv \frac{4}{5}$$

$$\frac{1}{2} \equiv \frac{4}{8}$$

or

$$\frac{2}{3} \equiv \frac{6}{9}$$

You may have found different sets of equivalent fraction pairs. If you are unsure whether your equivalent fraction pairs are correct, check them with your teacher.

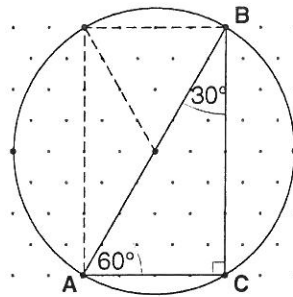
- b) 7 and 9 are not used. or 1 and 7 are not used.

2. a) This is one set of 4 equivalent fraction pairs. You may have used the numbers to create different equivalent fractions.

- b) The numbers not used were:
11, 13, 17 and 19. All prime numbers larger than 10.

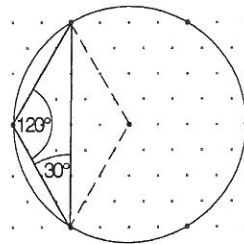
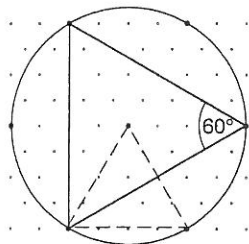
2375 Polygons in Circles

1. c) $\angle BAC = 60^\circ$ because isometric paper is created from equilateral triangles.
 $\angle ABC = 30^\circ$ because angles of a triangle add up to 180° .



2. a) Equilateral triangle

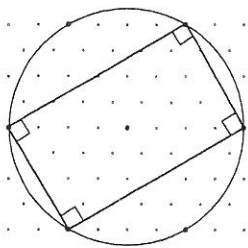
- b) Isosceles triangle



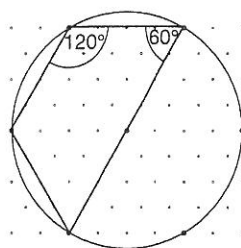
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2375 Polygons in Circles (cont)

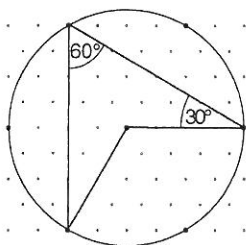
c) A rectangle



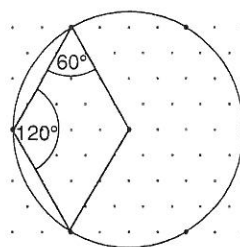
d) A trapezium



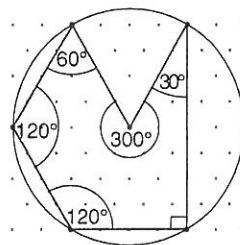
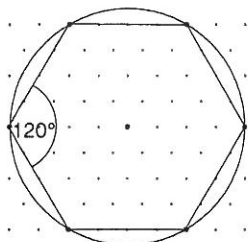
e) An arrowhead



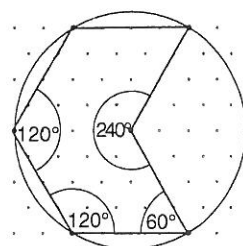
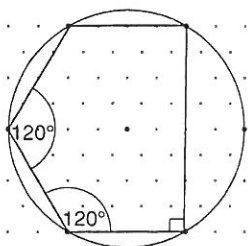
f) A rhombus



g) A hexagon



h) A pentagon



3. If your polygons are similar to those given in question 2, all the shapes are cyclic except:
- the equilateral triangle with one vertex at the centre of the circle.
 - the isosceles triangle with one vertex at the centre of the circle.
 - the arrowhead
 - the rhombus
 - the irregular hexagon
 - the pentagon with one vertex at the centre of the circle.
-

2376 Maths in Your Head (SMILE)

No answers required

2377 TenSprint(SfW)

You may have played the game against the clock. Well done if you managed to run the 200m race in less than 3 minutes.

If the five dice showed these numbers, you could make 6 lots of 10.

2378 Matching Fractions(SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2379 Ordering Fractions (SfW)

Well done if you managed to score more than 40, especially if you scored this on Level 2.

2380 NumberLines (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLine Certificate.

2381 NumberLinesD (SfW)

Well done if you managed to score 10 out of 10 in all five levels and claim your SMILE NumberLineD Certificate.
