



## ANSWERS

- 1**
- a** Modal weight: 82.4 kg
  - b** Weight range:  $100.1 \text{ kg} - 78.3 \text{ kg} = 21.8 \text{ kg}$
  - c** With eight values in the data set, the median is between the 4th and 5th value, i.e. 82.4 kg and 84.7 kg  $(82.4 + 84.7) \div 2 = 83.55 \text{ kg}$
  - d** Maximum weight of sixth man: a mean weight of 87.5 kg means that in total, the crew of six sailors must be no more than 525 kg. The selected five sailors weigh 432.4 kg altogether. That means the sixth sailor must weigh no more than  $525 - 432.4 = 92.6 \text{ kg}$
  - e** Recommended sixth man: Iain Jenson (78.3 kg) or Leigh McMillan (82.4 kg)
- 2**
- a** Range of data:  $5.354 - 0.060 = 5.294 \text{ tonnes}$
  - b** Mean waste value: total of seven days' waste value is 6.499 tonnes.  $6.499 \div 7 = 0.928 \text{ tonnes}$
  - c** Median waste value: the values in order are 0.060, 0.180, 0.210, 0.228, 0.238, 0.229, 5.354. With seven values in the data set, the median is the fourth value, i.e. 0.228 tonnes.
  - d** The median is the best average to represent the data. The mean is not a good average to use as there is an outlier which skews the mean (5.354 tonnes on 31st August).
  - e** Mark might want to verify if there was a cause for the unusually high level of waste on 31st August and could do this by looking into the activities which took place on this day. On 31st August, the boat building team disposed of the mould used to build the hull of the boat. This was the cause of the unusually high level of waste that day!



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**3**

**a** Range of data:  $26.6 \text{ knots} - 2.2 \text{ knots} = 24.4 \text{ knots}$

**b**

Speed range in knots (kn)	Tally	Frequency (f)	Midpoint (m)	$m \times f$
$x < 5 \text{ kn}$	///	3 3rd	2.5 kn	7.5
$5 \text{ kn} \leq x < 10 \text{ kn}$	//	2 5th	7.5 kn	15.0
$10 \text{ kn} \leq x < 15 \text{ kn}$	////	4 9th	12.5 kn	50.0
$15 \text{ kn} \leq x < 20 \text{ kn}$	//	2 11th	17.5 kn	35.0
$20 \text{ kn} \leq x < 25 \text{ kn}$		0 11th	22.5 kn	0.0
$25 \text{ kn} \leq x < 30 \text{ kn}$	/	1 12th	27.5 kn	27.5

**c** The class interval that contains the median: With 12 values in the data set, the median will be the class with the sixth and seventh values in it, i.e.  $10 \text{ kn} \leq x < 15 \text{ kn}$

**d** Estimate for the mean:  $135 \div 12 = 11.25 \text{ kn}$