Differentiation and Integration Involving Indices

The cards in this activity use multiple representations of differentiation and integration that match together.

Preparation
- Copy each representation onto different coloured card.
- The sheets can be given out all at once or
- Give the first 4 sheets followed by the last 2 sheets on completion or
- Give out the first two sheets followed by the other sheets one at a time when required

The advantage of not giving them all at once is that some students can feel overwhelmed if there are lots of cards to sort all at once. However, if the sheets are given out in too many steps, students can feel that the tasks are endless.

$y = 2\sqrt{x}$	$y = \dfrac{1}{2x^3}$
$y = \dfrac{2}{x^2}$	$y = \sqrt{x}$
$y = \dfrac{2}{\sqrt{x}}$	$y = \dfrac{1}{2\sqrt{x}}$
$y = \dfrac{1}{2x^2}$	$y = \dfrac{1}{\sqrt{x}}$
$y = \dfrac{2}{x^3}$	$y = \dfrac{1}{x^2}$

$$y = 2x^{-2}$$

$$y = 2x^{-\frac{1}{2}}$$

$$y = \frac{1}{2}x^{-2}$$

$$y = 2x^{\frac{1}{2}}$$

$$y = x^{\frac{1}{2}}$$

$$y = 2x^{-3}$$

$$y = x^{-2}$$

$$y = \frac{1}{2}x^{-\frac{1}{2}}$$

$$y = x^{-\frac{1}{2}}$$

$$y = \frac{1}{2}x^{-3}$$

$$\frac{dy}{dx} = -4x^{-3}$$

$$\frac{dy}{dx} = -\frac{1}{4}x^{-\frac{3}{2}}$$

$$\frac{dy}{dx} = -6x^{-4}$$

$$\frac{dy}{dx} = x^{-\frac{1}{2}}$$

$$\frac{dy}{dx} = -\frac{1}{2}x^{-\frac{3}{2}}$$

$$\frac{dy}{dx} = -x^{-3}$$

$$\frac{dy}{dx} = -x^{-\frac{3}{2}}$$

$$\frac{dy}{dx} = -\frac{3}{2}x^{-4}$$

$$\frac{dy}{dx} = \frac{1}{2}x^{-\frac{1}{2}}$$

$$\frac{dy}{dx} = -2x^{-3}$$

$\int y\,dx = \dfrac{4}{3}x^{\frac{3}{2}} + c$	$\int y\,dx = -\dfrac{1}{2}x^{-1} + c$
$\int y\,dx = -x^{-2} + c$	$\int y\,dx = -\dfrac{1}{4}x^{-2} + c$
$\int y\,dx = \dfrac{2}{3}x^{\frac{3}{2}} + c$	$\int y\,dx = -2x^{-1} + c$
$\int y\,dx = 2x^{\frac{1}{2}} + c$	$\int y\,dx = 4x^{\frac{1}{2}} + c$
$\int y\,dx = -x^{-1} + c$	$\int y\,dx = x^{\frac{1}{2}} + c$

$$\frac{dy}{dx} = \frac{1}{\sqrt{x}}$$

$$\frac{dy}{dx} = \frac{-6}{x^4}$$

$$\frac{dy}{dx} = \frac{-3}{2x^4}$$

$$\frac{dy}{dx} = -\frac{2}{x^3}$$

$$\frac{dy}{dx} = -\frac{1}{4\sqrt{x^3}}$$

$$\frac{dy}{dx} = -\frac{4}{x^3}$$

$$\frac{dy}{dx} = -\frac{1}{\sqrt{x^3}}$$

$$\frac{dy}{dx} = -\frac{1}{x^3}$$

$$\frac{dy}{dx} = \frac{1}{2\sqrt{x^3}}$$

$$\frac{dy}{dx} = \frac{1}{2\sqrt{x}}$$

$$\int y\,dx = -\frac{2}{x} + c$$

$$\int y\,dx = -\frac{1}{x} + c$$

$$\int y\,dx = -\frac{1}{2x} + c$$

$$\int y\,dx = \sqrt{x} + c$$

$$\int y\,dx = \frac{2}{3}\sqrt{x^3} + c$$

$$\int y\,dx = \frac{4}{3}\sqrt{x^3} + c$$

$$\int y\,dx = 2\sqrt{x} + c$$

$$\int y\,dx = -\frac{1}{4x^2} + c$$

$$\int y\,dx = -\frac{1}{x^2} + c$$

$$\int y\,dx = 4\sqrt{x} + c$$