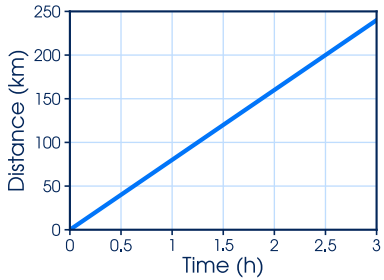
GCSE HIGHER · REVISION MAT 3

# Rates of change from graphs

**1** Find the speed of the car.



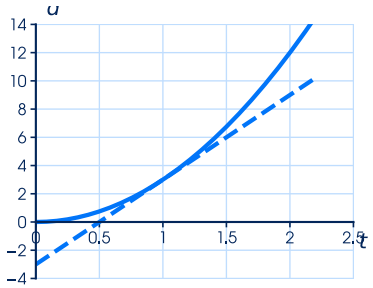

**2** Find the average rate of change of $y = 2x^2$ between $x = 1$ and $x = 2$.

**3** On a graph of depth against time, what does a steeper section show?

**4** $V = 1000 \times 0.8^t$

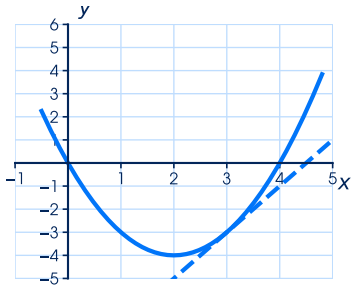
Find the average rate of change between $t = 0$ and $t = 2$.

**5** A tangent is drawn to $d = 3t^2$ at $t = 1$.




Show that the speed at $t = 1$ is 6.

**6** Estimate the gradient of $y = x^2 - 4x$ at $x = 3$.




**7** Explain why the gradient at a turning point is 0.

**8** $C = 50 + 30\sqrt{t}$

Estimate the rate of change at $t = 4$ using $t = 3.9$ and $t = 4.1$.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

# Rates of change from graphs

**1** $\frac{240}{3}$

**80 km/h**

**2** $\frac{8-2}{1}$

**6**

**3** **The depth is increasing faster.**

**4** $\frac{640-1000}{2}$

**–180 per year**

**5** Tangent through (0, –3) and (2, 9)

$\frac{12}{2} = 6$

**6** Tangent through (3, –3) and (4.5, 0)

**Gradient 2**

**7** **The tangent there is horizontal.**

**8** $30(\sqrt{4.1} - \sqrt{3.9}) = 1.500$

$\div 0.2$

$\approx 7.5$

Mr&Mrs MATHS