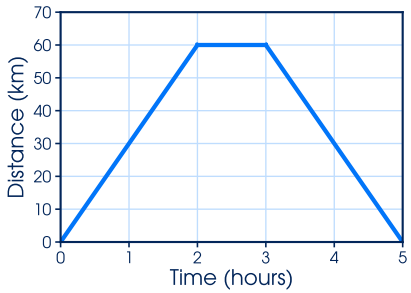
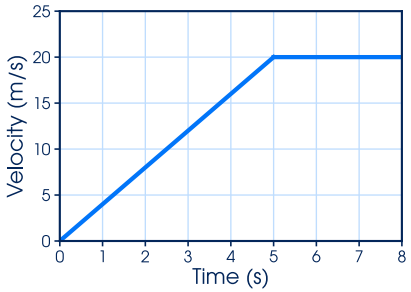
GCSE HIGHER · REVISION MAT 1

Gradients and areas under graphs

1 Find the speed for the first 2 hours.



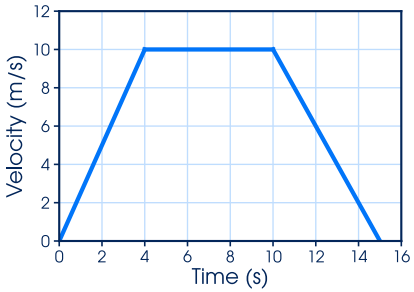
2 Find the acceleration.



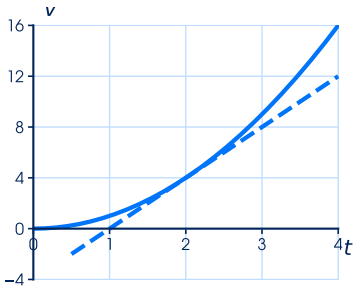
3 A distance–time graph is a straight line from (0, 0) to (4, 10).

What does its gradient represent? Find it.

4 Find the total distance travelled.



5 A tangent is drawn to the curve at $t = 2$.



Estimate the gradient of the curve at $t = 2$.

6 The table gives the velocity of a car.

t (s)	0	1	2	3	4
v (m/s)	1	2	5	10	17

Use 4 strips of equal width to estimate the distance travelled in 4 seconds.

7 A car slows down uniformly from 24 m/s to rest in 8 seconds.

Show that it travels 96 m while stopping.

8 A cyclist accelerates uniformly from rest to V m/s in 10 s.

She then travels at V m/s for 20 s.

She travels 375 m in total.

Find V.

ANSWERS · REVISION MAT 1

Gradients and areas under graphs

1 $\frac{60}{2}$

30 km/h

2 $\frac{20}{5}$

4 m/s²

3 The gradient is the speed.

$\frac{10}{4}$ **= 2.5 units per unit of time**

4 $\frac{1}{2} \times 4 \times 10 + 6 \times 10 + \frac{1}{2} \times 5 \times 10$

$= 20 + 60 + 25$

105 m

5 Tangent passes through (1, 0) and (3, 8).

Gradient ≈ 4

6 $\frac{1}{2}(1 + 17) + 2 + 5 + 10$

≈ 26 m

7 Area of triangle $= \frac{1}{2} \times 8 \times 24$

= 96 m

8 $\frac{1}{2} \times 10V + 20V = 375$

$25V = 375$

V = 15