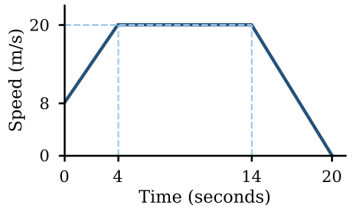
| Day 279 | IGCSE 10-a-day |
|---|---|
| **1** Work out $(1.5 \times 10^3)^3$<br>Give your answer in standard form. | |
| **2** The braking distance d metres of a car is directly proportional to the square of its speed v km/h.<br>When v = 2, d = 8m.<br>Find the value of d when v = 3. | |
| **3** The volume, V $cm^3$, of a sphere of radius r cm is $V = \frac{4}{3}\pi r^3$.<br>(a) Find $\frac{dV}{dr}$ when r = 8.<br>(b) Find the value of r when $\frac{dV}{dr} = 144\pi$. | |
| **4** Here are 15 numbers.<br>58, 46, 18, 23, 47, 30, 11, 22, 4, 30, 5, 5, 39, 57, 36<br>Find (a) the median (b) the interquartile range. | |
| **5** A curve has equation $y = x^3 - 12x^2 + 41x - 5$.<br>Find the equations of the two tangents to the curve that are parallel to the line y = 5x + 9. | |

**Day 279** **IGCSE 10-a-day**

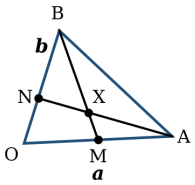
**6** The graph shows the speed of a train during 20 seconds.
(a) Work out the acceleration during the first 4 seconds.
(b) Work out the average speed over the whole 20 seconds.




**7** A rectangle has length 23 cm and width 17 cm. Both measurements are correct to the nearest centimetre.
Jess says that the area of the rectangle could be exactly 367 $cm^2$.
Is Jess correct? You must show your working.

**8** (a) Show that the equation $x^3 - x - 14 = 0$ can be rearranged to give $x = \sqrt[3]{x + 14}$ (Calculator)
(b) Use the iteration formula $x_{n+1} = \sqrt[3]{x_n + 14}$ with $x_0 = 2$ to work out $x_1$ and $x_2$. Give each answer correct to 3 decimal places.

**9** OAB is a triangle. OA = **a** and OB = **b**.
M is on OA with OM : MA = 1 : 1. N is on OB with ON : NB = 2 : 3. AN and BM intersect at X.
(a) Find BM in terms of **a** and **b**.
(b) Find OX in terms of **a** and **b**.
The diagram is not drawn accurately.




**10** The curve $y = 2x^3 + 6x^2 - 18x - 3$ has two stationary points, A and B.
Work out the vertical distance between A and B.