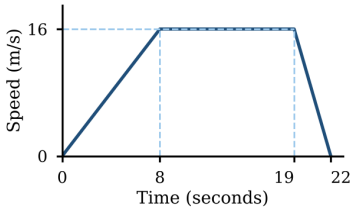
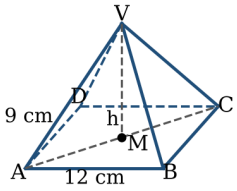
| Day 299 | S Tier 10-a-day |
|---|---|
| **1** Two shapes are mathematically similar.<br>The smaller has height 5 cm and area 12 $cm^2$.<br>The larger has area 48 $cm^2$.<br>Work out the height of the larger shape. | |
| **2** Expand and simplify $(x + 1)^2(x + 6)$ | |
| **3** The ratio of boys to girls in a school is 2 : 3.<br>50% of the boys and 85% of the girls walk to school.<br>What percentage of all of these students walk to school? | |
| **4** Evan invests £5,000.<br>The account pays compound interest of 6% a year for the first 3 years,<br>then 3.5% a year for the next 2 years.<br>Work out the total amount after 5 years, to the nearest penny. (Calculator) | |
| **5** The graph shows the speed of a cyclist during 22 seconds.<br>(a) Work out the acceleration during the first 8 seconds.<br>(b) Work out the average speed over the whole 22 seconds.<br> | |

| Day 299 | S Tier 10-a-day |
|---|---|

**6** Make u the subject of $v = \frac{7u + 1}{u - 3}$

**7** VABCD is a pyramid on a square base. V is directly above the centre M.
(a) Work out the height VM of the pyramid.
(b) Work out the volume of the pyramid.
The diagram is not drawn accurately.




**8** A factory makes 5,000 parts. 2% of them are faulty.
A scanner flags 98% of faulty parts and wrongly flags 4% of parts that are not faulty.
A part is chosen at random from the parts flagged by the scanner.
Work out the probability that this part is faulty.

**9** A circle has equation $x^2 + y^2 = 65$.
The point P(−7, −4) lies on the circle.
Find an equation of the tangent to the circle at P.
Give your answer in the form ax + by = c, where a, b and c are integers.

**10** Given that $(a + \sqrt{7})(b + \sqrt{7}) = 19 + 8\sqrt{7}$, where a and b are positive integers with a < b, find the values of a and b.