Day 251 **S Tier 10-a-day**

1 Work out $(5\frac{1}{2} - 1\frac{1}{4}) \times \frac{2}{3}$

Give your answer as a mixed number or a fraction in its simplest form.

2 Work out the value of $\frac{2m - n}{k}$

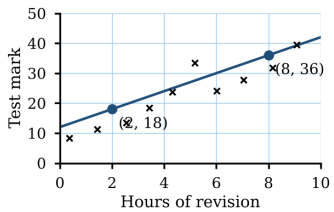
when $m = 1$, $n = -1$ and $k = -4$.

3 A metal pipe is a hollow cylinder of length 80 cm. (Calculator)
The outer radius is 8 cm and the inner radius is 6.5 cm.
The density of the metal is 8.5 g/cm^3.
Work out the mass of the pipe. Give your answer in kilograms correct to 3 significant figures.

4 $f(x) = \frac{3}{x - 4} + 1$

(a) Find $f^{-1}(x)$.
(b) Find the value of $f^{-1}(0)$.

5 The scatter graph shows hours of revision (x) and test mark (y).
The equation of the line of best fit is $y = 3x + 12$.
(a) Estimate y when x = 9.
(b) Explain why an estimate of y when x = 25 may be unreliable.



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6 Work out the exact value of $(\cos 60°)^2 + \tan 60°$
Give your answer in its simplest form, as a fraction or surd. Do not use a calculator.

7 Gareth cycles $\frac{2}{3}$ of a route before lunch.
After lunch he cycles $\frac{3}{5}$ of the remaining distance.
He still has 22 km to go.
How long is the route, in km?

8 The table shows information about 77 employees.
(a) An employee who walks to work is chosen at random. Work out the probability that this employee is a woman.
(b) Two of the 77 employees are chosen at random. Work out the probability that both are women.

	Bus	Car	Walk
Men	7	10	22
Women	20	9	9

9 The area of a circle is 342 cm^2, correct to the nearest cm^2.
Work out the lower bound of the radius of the circle.
Give your answer correct to 3 significant figures. (Calculator)

10 Solve the simultaneous equations
$x^2 + y^2 = 50$
$y = -x + 8$