Day 23 **IGCSE 10-a-day**

1 Solve $\frac{x-3}{5} + \frac{x-7}{2} = -2$

2 Differentiate $6x^2 + 2x + \frac{7}{x^2}$ with respect to x.

3 An arithmetic sequence has term 4 equal to 12 and term 8 equal to 0.
(a) Find an expression for the nth term.
(b) Find the first term of the sequence that is less than -100.

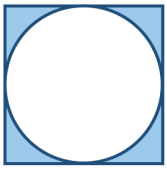
4 Two shapes are mathematically similar.
The smaller has height 6 cm and area 36 cm^2.
The larger has area 225 cm^2.
Work out the height of the larger shape.

5 The table shows the daily visitors over six periods.
The 3-point moving average centred on Thu is 17.
(a) Work out the value of x.
(b) Work out the 3-point moving average centred on Fri.

	Mon	Tue	Wed	Thu	Fri	Sat
Value	18	19	22	x	22	40

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6 The diagram shows a circle inside a square of side 8 cm.
The circle touches all four sides of the square.
Work out the area of the shaded region. Give your answer in terms of π.



7 θ is an acute angle and $\sin\theta = \frac{5}{7}$.
Find the exact value of (a) $\cos\theta$ (b) $\tan\theta$.
Give each answer as a fraction, rationalising any denominator.

8 The tangent to the curve $y = x^2 - 3x + 6$ at the point where $x = 2$ meets the axes at A and B.
Work out the area of triangle OAB, where O is the origin.

9 Simplify $\frac{3}{3+\sqrt{7}} - \frac{1}{3-\sqrt{7}}$
Give your answer with a rational denominator.

10 $y = 2x^{5/2} + x^2 - \frac{4}{\sqrt{x}}$
Find $\frac{dy}{dx}$. Give each term of your answer in the form ax^n.