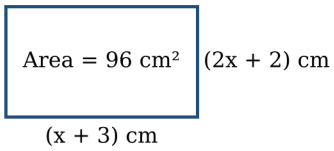
Day 259	IGCSE 10-a-day
1 Given that $\frac{25^3 \times 25}{5^3} = 5^n$, find the value of n.	
2 f(x) = 3x + 2. (a) Find $f^{-1}(11)$. (b) Express ff(x) in the form px + q.	
3 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where $s = 2t^2 + t + 4 + \frac{12}{t}$ $(t > 0)$ Find (a) the velocity of P, (b) the acceleration of P, when t = 2.	
4 The diagram shows a rectangle of length (x + 3) cm, width (2x + 2) cm and area 96 cm^2. (a) Show that $2x^2 + 8x - 90 = 0$. (b) Work out the length of the diagonal of the rectangle. Give your answer correct to 3 significant figures. 	
5 Solve $3x^2 + 6x - 5 = 0$ Give your answers in surd form.	

Day 259 **IGCSE 10-a-day**

6 $y = (\sqrt{x} + 2)^2$

Find $\frac{dy}{dx}$. Give each term of your answer in the form ax^n.

7 In one country, income tax is worked out like this:
The first £12,500 of income is not taxed.
The next £30,000 is taxed at 20%.
All income above that is taxed at 40%.
Nia earns £62,500 in a year.
Work out how much income tax Nia pays.

8 The curve $y = 2x^3 - 24x + k$, where k is a constant, has the x-axis as a tangent.
Find the two possible values of k.

9 Bottle A holds concentrate and water in the ratio 3 : 1.
Bottle B holds concentrate and water in the ratio 5 : 6.
8 litres from bottle A and 22 litres from bottle B are mixed.
Work out the ratio of concentrate to water in the mixture.

10 $\mathbf{OA} = \mathbf{a}$, $\mathbf{OB} = \mathbf{b}$, $\mathbf{OP} = \frac{2}{3}\mathbf{a}$ and $\mathbf{OQ} = \frac{3}{5}\mathbf{b}$.
AQ and BP meet at X.
(a) Find **OX** in terms of **a** and **b**.
(b) Find the ratio AX : XQ.

