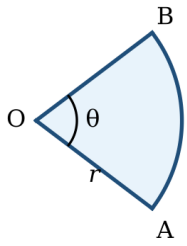
Day 198 **A Level Maths: B Tier 10-a-day**

1 A survey covers 56 urban, 32 suburban and 36 rural households.
A stratified sample of size 31 is taken. Find the number selected from each group.

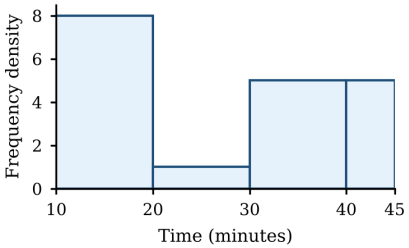
2 The diagram shows a sector OAB of a circle with centre O, radius 15 cm and angle 1.4 radians.
Find (a) the arc length AB, (b) the area of the sector.



3 A ball is dropped from rest from a window, 30.625 m above the ground.
Take $g = 9.8$ m s^{-2}.
Find (a) the time taken to reach the ground, (b) its speed on landing.

4 Prove that $3x^2 - 24x + 51 > 0$ for all real values of x.

5 The histogram shows the times taken by a group of people to complete a task.
Estimate the number of people who took between 20 and 41 minutes.



Day 198	A Level Maths: B Tier 10-a-day
6 A new car costs £12000. Its value falls by 10% each year. (a) Find its value after 6 years (nearest £). (b) In which year does it first fall below £3000?	
7 The radius of a circular oil slick increases at 0.3 cm per second. Find the rate at which its area is increasing when r = 10 cm, in terms of π.	
8 Solve the equation $5^{2x} - 4\times5^{x} - 5 = 0$.	
9 A javelin is projected from level ground with horizontal velocity component 30 m s^{-1} and vertical velocity component 14.7 m s^{-1} upwards. Take g = 9.8 m s^{-2}. Find (a) the time of flight, (b) the horizontal range.	
10 A curve has equation $x^2 + xy + 3y^2 + 2y - x = 33$. Find $\frac{dy}{dx}$ in terms of x and y, and the gradient at $(-2, 3)$.	