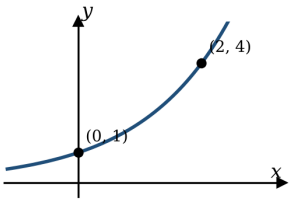
Day 254	IGCSE 10-a-day
1 The surface area, S cm^2, of a sphere of radius r cm is $S = 4\pi r^2$. (a) Find $\frac{dS}{dr}$ when r = 2. (b) Find the value of r when $\frac{dS}{dr} = 16\pi$.	
2 A flight leaves London at 09:45 (London time). It takes 13 hours 40 minutes. When it is 12:00 in London it is 21:00 in Sydney. At what time, in Sydney time, does the flight land? Say if it is on a different day.	
3 Triangle ABC has AB = 5 cm and BC = 6 cm. The area of triangle ABC is $\frac{15\sqrt{2}}{2}$ cm^2. Angle ABC is acute. Work out the size of angle ABC. Do not use a calculator.	
4 The diagram shows part of the graph of $y = ab^x$. The curve passes through (0, 1) and (2, 4). (a) Find the values of a and b. (b) Work out the value of y when x = 3. 	
5 Write $0.70\dot{0}\dot{2}$ as a fraction in its simplest form.	

Day 254	IGCSE 10-a-day
6 C is directly proportional to the cube of d. When d = 1, C = 12. (a) Find a formula for C in terms of d. (b) Work out the value of C when d = 3.	
7 $y = -x^3 + 3x^2 + 24x + 5$ Find the range of values of x for which y is decreasing.	
8 $n(\xi) = 40$, $n(A) = 17$, $n(B) = 11$ and $n(A \cap B) = 5$. An element of ξ is chosen at random. (a) Find the probability that it is in neither A nor B. (b) Given that it is in A, find the probability that it is not in B.	
9 The 2nd term of a geometric sequence is 27. The 5th term of the sequence is 1. (a) Work out the common ratio. (b) Work out the first term.	
10 A particle P moves on a straight line. At time t seconds (t > 0), its distance from a point O is s metres, where $s = t^2 + \frac{54}{t}$ Show that P is at its minimum distance from O when t = 3, and find this minimum distance.	