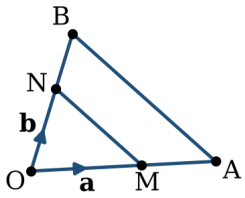
Day 283 **IGCSE 10-a-day**

1 A particle P moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where
$s = t^3 - 15t^2 + 63t + 5$ $(t \geq 0)$
Find the distance between the two positions where P is at rest.

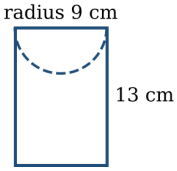
2 Write these numbers in order of size, starting with the largest.
$\frac{7}{16}$, 0.84, $\frac{3}{11}$, 0.86

3 In triangle OAB, $\mathbf{OA} = \mathbf{a}$ and $\mathbf{OB} = \mathbf{b}$.
M is on OA and N is on OB, with OM : MA = ON : NB = 3 : 2.
(a) Show that MN is parallel to AB.
(b) Write down the ratio MN : AB.



4 Beth changes £400 into euros at £1 = €1.35.
Beth spends €170 and then changes the rest back into pounds at £1 = €1.6.
How many pounds does Beth get back?

5 A solid cylinder of radius 9 cm and height 13 cm has a hemispherical hollow of the same radius cut out of the top.
Work out the volume of the solid that is left.
Give your answer in terms of π.



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6 A curve has equation $y = ax^2 + \frac{b}{x}$, where a and b are constants. The point (2, 10) lies on the curve and the gradient of the curve at this point is 7. Find the values of a and b.	
7 Solve $3x^2 - 12x - 36 \geq 0$	
8 The probability that it rains is $\frac{1}{2}$. If it rains, the probability that Sam is late is $\frac{1}{3}$. If it does not rain, the probability is $\frac{5}{6}$. (a) Work out the probability that Sam is late. (b) Given that Sam is late, work out the probability that it rained.	
9 Write $\frac{16^{n+1} \times 4^{n+1}}{2^n}$ in the form 2^{an+c} where a and c are integers.	
10 A curve has equation $y = -x^2 + 2x + k$, where k is a constant. The tangent to the curve at the point where $x = -1$ passes through $(-3, -13)$. Find the value of k.	