Day 331	IGCSE 10-a-day
1 Write these numbers in order of size, starting with the smallest. 83%, $\frac{12}{13}$, $\frac{1}{3}$, $\frac{6}{7}$	
2 The equation of a curve is $y = 2x^2 - 5x + \frac{4}{x}$. Work out the gradient of the curve at the point where $x = -4$.	
3 The price of a phone is increased by 40%. The new price is then decreased by 5%. Work out the overall percentage change in the price.	
4 The temperature, T °C, of a cup of tea t minutes after it is removed from a heat source is modelled by $T = 25 + \frac{64}{t}$ $(t \geq 1)$ (a) Find $\frac{dT}{dt}$ when $t = 4$. (b) Find the value of t when the temperature is falling at 64 °C per minute.	
5 In triangle PQR, PQ = 11 cm and angle PQR = 135°. The area of the triangle is $11\sqrt{2}$ cm^2. Work out the length of QR. Do not use a calculator.	

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6 Solve the simultaneous equations $y = x^2 + 2x + 4$ $y = -5x - 8$	
7 The probability that it rains is $\frac{3}{10}$. If it rains, the probability that Sam is late is $\frac{1}{6}$. If it does not rain, the probability is $\frac{1}{2}$. (a) Work out the probability that Sam is late. (b) Given that Sam is late, work out the probability that it rained.	
8 $f(x) = x^3 + kx^2 + 48x - 4$, where k is a constant. Given that f is an increasing function for all values of x, find the range of possible values of k.	
9 $A = \begin{pmatrix} 1 & -4 \\ 1 & 5 \end{pmatrix}$. $A^2 = pA + qI$, where I is the 2 × 2 identity matrix. Find the value of p and the value of q.	
10 Leila drives 75 km at an average speed of 25 km/h. The drive then continues for another 40 km at an average speed of 20 km/h. Work out the average speed for the whole journey.	