Day 48	IGCSE 10-a-day
1 Work out the exact value of $\sin^2 60° + \tan^2 45°$. Give your answer in its simplest form, with no decimals.	
2 The equation of a curve is $y = -4x^{3/2} + 2\sqrt{x}$. Work out the gradient of the curve at the point where $x = 1$.	
3 A circle has equation $x^2 + y^2 = 625$. The point P(24, −7) lies on the circle. (a) Find the equation of the tangent to the circle at P. Give your answer in the form $ax + by = c$, where a, b and c are integers. (b) The tangent meets the x-axis at the point T. Write down the coordinates of T.	
4 A fair 4-sided dice and a fair 6-sided dice are each thrown once. The first score and the second score are recorded. (a) Work out the probability that the product is greater than 8. (b) Given that at least one number is 3, work out the probability that the product is greater than 8.	
5 A curve has equation $y = 3x^2 - \frac{6}{x}$. Find the equation of the tangent to the curve at the point where $x = -2$.	

Day 48	IGCSE 10-a-day
6 y is inversely proportional to x. When x = 5, y = 12. Find the positive value of x when y = 20.	
7 A bakery makes x cakes and y loaves in a morning. Each cake needs 6 minutes of oven time and 6 kg of flour. Each loaf needs 3 minutes of oven time and 6 kg of flour. There are 30 minutes of oven time and 48 kg of flour available. The profit is £4 for each cake and £3 for each loaf. (a) Write down two inequalities, other than $x \geq 0$, $y \geq 0$. (b) Find the greatest profit.	
8 The HCF of two numbers is 6 and their LCM is 330. The smaller number is 30. Work out the larger number.	
9 A closed cylinder (a drum) has radius r cm, height h cm and total surface area 486π cm^2. (a) Show that its volume, V cm^3, is $V = 243\pi r - \pi r^3$. (b) Find the maximum value of V in terms of π, and show that h = 2r when V is a maximum.	
10 The equation $x^2 + kx + 16 = 0$ has exactly one solution. Find the possible values of k. Give any surds in their simplest form.	