Day 159	IGCSE 10-a-day
1 In triangle PQR, PQ = 12 cm and angle PQR = 135°. The area of the triangle is $54\sqrt{2}$ cm^2. Work out the length of QR. Do not use a calculator.	
2 A curve has equation $y = 3x^2 + 5x + 9$. The gradient at the point P on the curve is -19. Find the coordinates of P.	
3 f(x) = ax + b, where a and b are constants. $f(-3) = 5$ and $f^{-1}(-16) = 4$. Find the value of a and the value of b.	
4 Simplify $(8x^6y^9)^{\frac{2}{3}}$	
5 £2,500 is invested at 10% per year compound interest. Work out the least whole number of years after which the investment is worth more than £5,000. (Calculator)	

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6 y is directly proportional to the cube of x. When x = 1, y = 12. (a) Find a formula for y in terms of x. (b) Work out the positive value of x when y = 324.	
7 A solid cylinder of radius 8 cm and height 10 cm is melted down. The metal is used to make identical solid spheres of radius 2 cm. Work out the number of spheres that can be made. The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$.	
8 A curve has equation $y = -2x^3 - 15x^2 - 24x + 2$. Find the coordinates of the stationary points of the curve.	
9 The area of a square is 353 cm^2, correct to the nearest cm^2. Work out the upper bound of the side length of the square. Give your answer correct to 3 significant figures. (Calculator)	
10 The tangent to the curve $y = -x^2 + 3x - 2$ at the point where x = 2 meets the axes at A and B. Work out the area of triangle OAB, where O is the origin.	