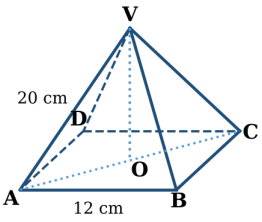
Day 127	IGCSE 10-a-day
1 A particle moves in a straight line. Its velocity, v m/s, at time t seconds is given by $v = 32t - 4t^2$ for $0 \leq t \leq 8$ Find the time at which the speed of the particle is greatest, and this greatest speed.	
2 $A = \begin{pmatrix} 0 & 5 \\ 0 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} -2 & 2 \\ 4 & -4 \end{pmatrix}$. Work out $A^2 - B^2$.	
3 A shop mixes two types of coffee. Type A costs £12.00 per kg and type B costs £4.00 per kg. They are mixed in the ratio A : B = 4 : 1. The mixture is sold for £13.52 per kg. Work out the percentage profit.	
4 $y = 2x^3 + 15x^2 + 36x + 2$ At the point where x = 3, is the curve increasing or decreasing? You must show your working.	
5 The point P(2, 6) is rotated 180° about the origin. The image is then rotated 90° anticlockwise about the origin. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	

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6 The lengths of the sides of a right-angled triangle are $(x - 4)$ cm, $(x + 3)$ cm and $(x + 5)$ cm. The longest side is $(x + 5)$ cm. (a) Show that $x^2 - 12x = 0$ (b) Hence work out the area of the triangle.	
7 $y = 2x^4 - 16x^2 - 7$ Find the coordinates of the stationary points of the curve and determine the nature of each.	
8 A circular arc has a chord AB of length 42 cm. The greatest distance between the chord and the arc is 7 cm. Work out the radius of the circle.	
9 VABCD is a pyramid. The base ABCD is a square with sides of 12 cm. The vertex V is vertically above the centre O of the base. VA = 20 cm. (a) Work out the vertical height VO. (b) Work out the angle between VA and the base. (Calculator) 	
10 a = 0.232 and b = 6.56, both correct to 3 significant figures. Work out a × b. Write down your answer to a suitable degree of accuracy. You must show your working and give a reason for your answer. (Calculator)	