Day 29	IGCSE 10-a-day
1 A ship leaves a port P and travels 77 km on a bearing of 155° to Q. (Calculator) It then travels 84 km on a bearing of 125° to R. (a) Work out the distance PR. (b) Work out the bearing of R from P. Give distances to 1 decimal place and the bearing to the nearest degree.	
2 $\mathbf{p} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$, $\mathbf{q} = \begin{pmatrix} -5 \\ 7 \end{pmatrix}$ and $\mathbf{r} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$. Work out $\mathbf{p} + 2\mathbf{q} - \mathbf{r}$.	
3 A particle moves in a straight line. After t seconds its displacement from a fixed point is s metres, where $s = 2t^3 - 12t^2 + 27t - 5$ (a) Show that the particle is never at rest. (b) Find the least speed of the particle and the time it occurs.	
4 Solve the simultaneous equations $-5x - y = 24$ $3x + 4y = 6$	
5 The area of a circle is directly proportional to the square of the radius. The radius is increased by 30%. Work out the percentage change in the area of a circle.	

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6 A curve has equation $y = 2x^4 - 16x^2 + 3$. Find the coordinates of the stationary points of the curve and determine the nature of each.	
7 Zane and Amir live 320 km apart. At 10:00 they set off towards each other on the same road. Zane drives at 85 km/h and Amir drives at 75 km/h. (a) At what time do they meet? (b) How far from Zane's home do they meet?	
8 The normal to the curve $y = x^3 - 2x + 2$ at the point where $x = -1$ meets the x-axis at N. Find the coordinates of N.	
9 A population is increased by x% in one year and then increased by a further x% the next year. Over the two years the population increases by 125%. Work out the value of x.	
10 In quadrilateral ABCD, AB = 12 cm, BC = 7 cm, CD = 12 cm, angle ABC = 54° and angle ACD = 44°. Work out the area of ABCD. Give your answer correct to 3 significant figures. (Calculator)  	