Day 301	IGCSE 10-a-day
1 Work out the value of $\frac{2x - y}{z}$ when $x = -1$, $y = -4$ and $z = -1$.	
2 $y = \frac{-6x^3 + 4x^2 - 7x}{x}$ Find $\frac{dy}{dx}$.	
3 60 beetles in a field are caught, marked and put back. Later, a second sample of 50 beetles is caught. 3 of these are marked. (a) Work out an estimate for the number of beetles in a field. (b) State one assumption you have made.	
4 A company makes and sells x thousand items. All amounts are in thousands of pounds. The revenue is $R = x(21 - 2x)$ and the cost is $C = 6 + 5x$. (a) Show that the profit $P = R - C$ is $P = -2x^2 + 16x - 6$. (b) Find the number of items that must be sold for the profit to be a maximum, and this maximum profit.	
5 Shape S has area 10 cm^2. S is transformed by the matrix $\begin{pmatrix} 6 & 5 \\ 2 & 2 \end{pmatrix}$. Work out the area of the image of S.	

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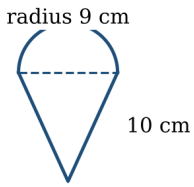
6 A particle moves in a straight line. Its displacement from O after t seconds is s metres, where

$s = t^2 + 4t + 8$

(a) Work out the average velocity of the particle between t = 2 and t = 4.

(b) Find the time at which the velocity equals this average velocity.

7 A solid is made from a cone of height 10 cm and a hemisphere. Both have radius 9 cm. Work out the total volume of the solid. Give your answer in terms of π.



8 Work out $(5 \times 10^{-4})^2$

Give your answer in standard form.

9 A fair 6-sided dice and a spinner numbered 1 to 5 are each thrown once. The first score and the second score are recorded.

(a) Work out the probability that the sum is a multiple of 3.

(b) Given that at least one number is 3, work out the probability that the sum is a multiple of 3.

10 The Venn diagram shows information about 47 shoppers.

A: bought fruit B: bought bread C: bought milk

(a) Find $n(A \cup C)$.

(b) Find $n(A' \cap C)$.

