Day 269	IGCSE 10-a-day

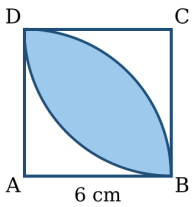
1 $y = -6x^2 - \frac{6}{x^2}$

Find $\frac{dy}{dx}$.

2 The line L has equation $4x - 3y = 12$.
L crosses the x-axis at the point A and the y-axis at the point B.
(a) Find the coordinates of A and B.
(b) Work out the length of AB.

3 $f(x) = 3x^2 - 18x + 9$
Use differentiation to find the coordinates of the turning point of the graph of $y = f(x)$. State whether it is a maximum or a minimum.

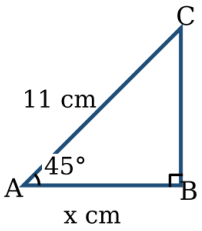
4 ABCD is a square of side 6 cm.
BD is an arc of a circle with centre A and an arc of a circle with centre C.
Work out the area of the shaded region. Give your answer in terms of π.



5 The time T seconds for a pendulum to swing is directly proportional to the square root of its length l metres.
When l = 25, T = 10s.
Find the value of T when l = 9.

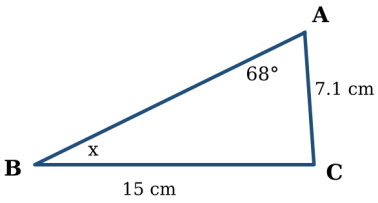
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6 ABC is a right-angled triangle.
Work out the exact value of x. Give your answer in its simplest form.
The diagram is not drawn accurately.



7 The value of a house is decreased by 5% in one year.
The next year its value is decreased by 15%.
It is now worth £88,825.
Work out the value of the house before the first change.

8 Angle B is acute.
Work out the size of angle ABC.
Give your answer correct to 1 decimal place.
(Calculator)



9 A metal crate in the shape of a cuboid weighs 840 N.
Its smallest face has area 500 cm^2. Its largest face has area 1,500 cm^2.
Pressure = force ÷ area
Work out (a) the greatest pressure and (b) the least pressure the metal crate can exert on the ground, in N/m^2.

10 The normal to the curve $y = x^2 + 5x - 3$ at the point P where $x = -2$ meets the curve again at Q.
Find the coordinates of Q.