Day 363 **IGCSE 10-a-day**

1 $f(x) = \frac{x - 2}{6}$.

(a) Find $f^{-1}(x)$.

(b) Find $f^{-1}(4)$.

2 Here are five numbers: $3x + 1$, x, $x + 6$, $3x - 3$, $2x + 1$.

The mean of the five numbers is 15.

(a) Work out the value of x.

(b) Work out the median of the five numbers.

3 A cylinder has radius r cm and fixed height 6 cm. Its volume is $V = 6\pi r^2$ cm^3.

(a) Find $\frac{dV}{dr}$ when $r = 6$.

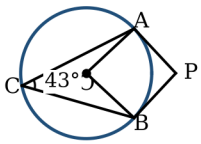
(b) Find the value of r when $\frac{dV}{dr} = 24\pi$.

4 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle ACB = 43°.

(a) Work out the size of angle AOB.

(b) Work out the size of angle APB.

The diagram is not drawn accurately.



5 Uma invests £4,000 for 5 years at 4% per year simple interest.

Lena invests £4,000 for 5 years at 4% per year compound interest.

Work out how much more interest Lena earns than Uma.

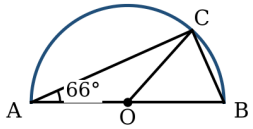
Give your answer to the nearest penny.

(Calculator)

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6 The curve $y = x^3 + ax^2 + bx$ has gradient 0 when $x = 3$ and gradient -4 when $x = 1$.
Find the values of a and b.

7 AB is a diameter of a circle, centre O. C is a point on the circle. Angle BAC = 66°.
(a) Work out the size of angle ACB.
(b) Work out the size of angle COB.
The diagram is not drawn accurately.



8 The point A lies on the curve $y = 2x^2 - 6x - 6$ where $x = 1$.
Find the equation of the normal at A. Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

9 The equation $kx^2 + 2x + 4 = 0$ has equal roots.
Find the value of k.

10 VABCD is a pyramid. The base ABCD is a square with sides of 5 cm.
The vertex V is 10 cm vertically above the centre O of the base.
M is the midpoint of BC.
Work out the angle between the face VBC and the base. (Calculator)

