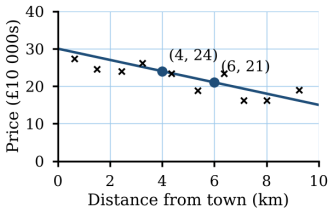
Day 243 **IGCSE 10-a-day**

1 The scatter graph shows distance from town (x) and price (y).
The equation of the line of best fit is $y = -1.5x + 30$.
(a) Estimate y when x = 3.
(b) Explain why an estimate of y when x = 15 may be unreliable.



2 $y = \frac{4x^4 + 2x^2 + 4x}{x}$

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

3 $f(x) = ax^2 + b$, where a and b are constants.
f(1) = 4 and f(3) = −12.
Find the value of a and the value of b.

4 Here are five numbers: 2x + 5, x + 2, x − 2, x + 5, 2x − 1.
The mean of the five numbers is 13.
(a) Work out the value of x.
(b) Work out the median of the five numbers.

5 The table shows the times taken by 61 people.
(a) Write down the modal class.
(b) Work out an estimate for the mean. Give your answer to 1 decimal place. (Calculator)

Time taken (minutes)	Frequency
$20 < x \leq 25$	4
$25 < x \leq 30$	9
$30 < x \leq 35$	13
$35 < x \leq 40$	13
$40 < x \leq 45$	22

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6 Write $24^5 \times 30^3$ as a product of powers of prime numbers.	
7 $f(x) = x^3 - 3x + 9$ Find the y coordinate of the local maximum point and the y coordinate of the local minimum point.	
8 A sector of a circle has radius 20 cm and angle 288°. The sector is made into a cone by joining the two straight edges together. (a) Work out the radius of the base of the cone. (b) Work out the exact volume of the cone. Give your answer in terms of π, as a surd if necessary.	
9 A closed cylinder (a container) has radius r cm, height h cm and total surface area 150π cm^2. (a) Show that its volume, V cm^3, is $V = 75\pi r - \pi r^3$. (b) Find the maximum value of V in terms of π, and show that h = 2r when V is a maximum.	
10 The line $y = 2x + k$ is a tangent to the circle $x^2 + y^2 = 29$. Find the possible values of k. Give any surds in their simplest form.	