Graphs

GCSE Maths · Practice Questions

20 questions · 63 marks total

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Section A · Foundation

Questions 1–3 are the most straightforward; they get harder as you go on. Question 10 is the most challenging.

1 **[1 mark]**

Write down the gradient of the line with equation $y = 3x - 5$

2 **[2 marks]**

A straight line has equation $y = 2x + 1$

(a) Write down the gradient of the line.

(b) Write down the coordinates of the point where the line crosses the y-axis.

3 **[2 marks]**

Does the point (3, 7) lie on the line $y = 2x + 1$?

You must show your working.

4 **[3 marks]**

Complete the table of values for $y = 2x - 3$

x	−1	0	1	2	3
y		−3		1	

5 **[3 marks]**

A is the point (1, 2) and B is the point (7, 10).

(a) Write down the coordinates of the midpoint of AB.

(b) Work out the gradient of the line AB.

6 [3 marks]

(a) Find the equation of the line with gradient −2 that passes through (0, 4).

(b) Is your line parallel to $y = -2x + 9$? Give a reason.

7 [3 marks]

A taxi firm charges a fixed fee of £3 plus £2 for every mile travelled.

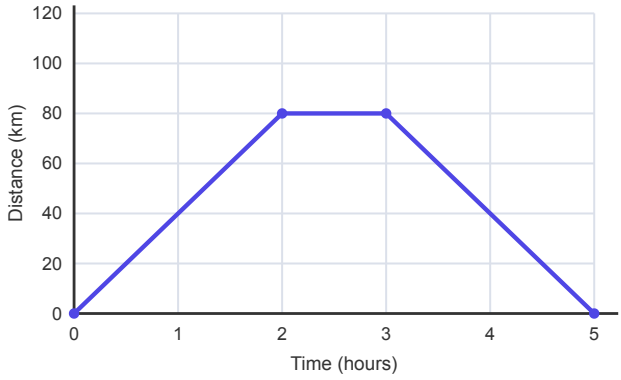
(a) Write a formula for the cost C pounds of a journey of m miles.

(b) Work out the cost of a 7 mile journey.

(c) If the formula is drawn as a graph, what does the number 3 tell you?

8 [3 marks]

The distance–time graph shows a cyclist's journey away from home and back again.



(a) How far had the cyclist travelled after 2 hours?

(b) For how long did the cyclist stop?

(c) Work out the cyclist's speed during the first stage of the journey.

9 [4 marks]

A straight line L passes through the points (1, 5) and (4, 14).

Find the equation of L.

10 **[4 marks]**

Two mobile phone tariffs are available.

Plan A: £10 per month plus 5p for each minute of calls.

Plan B: no monthly fee, 15p for each minute of calls.

(a) Write a formula for the monthly cost, in pounds, of each plan for m minutes of calls.

(b) Find the number of minutes for which the two plans cost the same.

(c) Which plan is cheaper for someone who talks for 150 minutes a month? Show your working.

Section B · Higher

Higher-tier style. Again, questions 1–3 are the gentlest and question 10 is the hardest.

1 **[2 marks]**

Work out the gradient of the line joining (−2, 1) and (4, 13).

2 **[2 marks]**

Rearrange $2y - 6x = 8$ into the form $y = mx + c$ and write down the gradient.

3 **[3 marks]**

Find the equation of the line that is parallel to $y = 3x - 1$ and passes through the point (2, 11).

4 **[3 marks]**

Find the equation of the line perpendicular to $y = 2x + 3$ that passes through the point (4, 1).

5 **[4 marks]**

The value, £V, of a car after t years is modelled by

$V = 12000 \times 0.85^t$

(a) Write down the value of the car when it was new.

(b) Work out the value of the car after 3 years.

(c) What does the number 0.85 tell you about the value of the car?

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6 **[4 marks]**

The graph of $y = f(x)$ has a minimum point at $(2, -3)$.

Write down the coordinates of the minimum point of each of these graphs.

(a) $y = f(x) + 5$

(b) $y = f(x - 3)$

(c) $y = -f(x)$

(d) $y = f(2x)$

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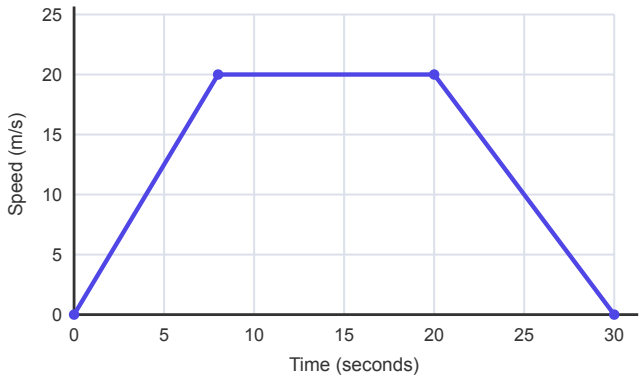
7 **[4 marks]**

The speed–time graph shows the first 30 seconds of a car's journey.



(a) Work out the acceleration during the first 8 seconds.

(b) Work out the total distance travelled in the 30 seconds.

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8 **[4 marks]**

(a) Factorise fully $x^3 - 4x$

(b) Hence write down the coordinates of the three points where the curve $y = x^3 - 4x$ crosses the x-axis.

9 **[4 marks]**

The line $3x + 4y = 24$ crosses the x-axis at A and the y-axis at B. O is the origin.

(a) Write down the coordinates of A and of B.

(b) Work out the length of AB.

(c) Work out the area of triangle OAB.

10 **[5 marks]**

A circle has equation $x^2 + y^2 = 20$

The line $y = x - 2$ cuts the circle at the points P and Q.

(a) Find the coordinates of P and Q.

(b) Work out the exact length of PQ, giving your answer in the form $a\sqrt{b}$.