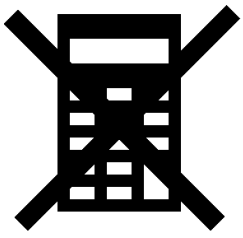
AQA, OCR, Edexcel

GCSE

GCSE Maths

Gradients of Straight Line Graphs

Name:

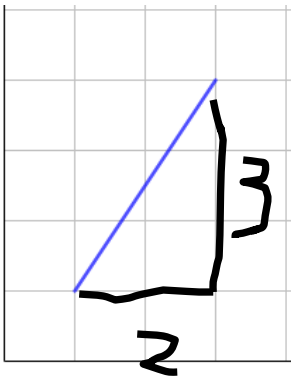


Guidance

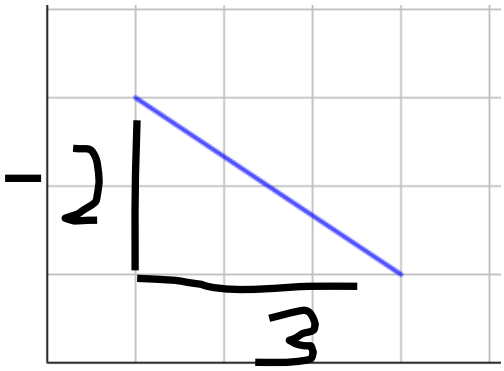
1. Read each question carefully.
2. Don't spend too long on each question.
3. Attempt every question.
4. Always show your workings.

Revise GCSE Maths:
www.MathsMadeEasy.co.uk/gcse-maths-revision/

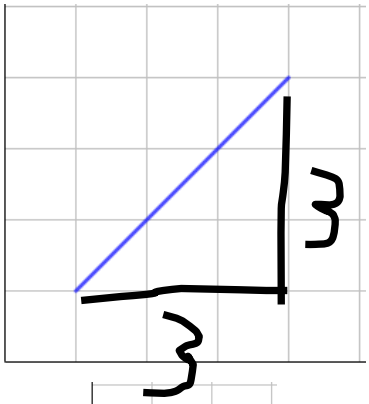
1. Calculate the gradient of each of the lines below.



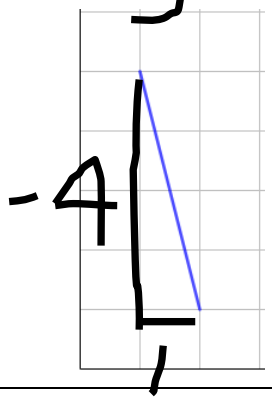
$\frac{3}{2}$



$-\frac{2}{3}$



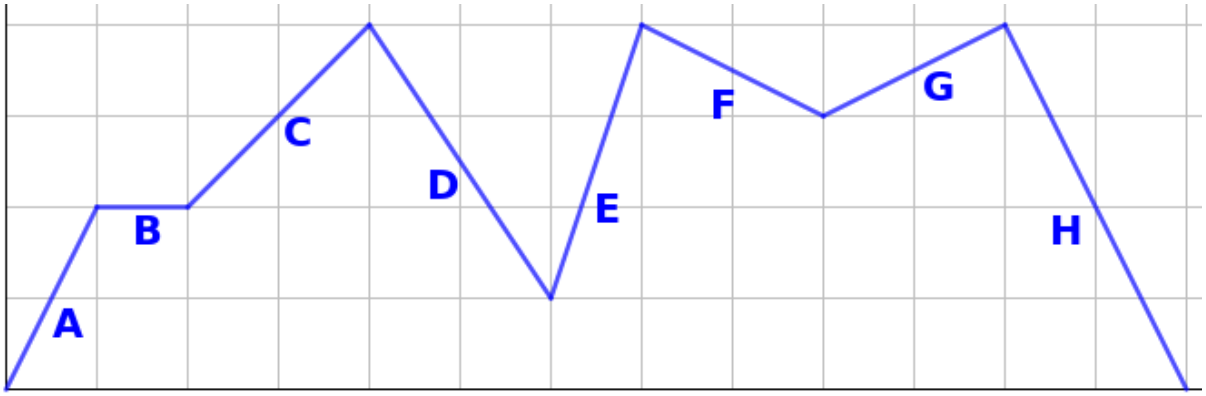
$\frac{3}{3} = 1$



$\frac{-4}{1} = -4$

(4 marks)

2. The line below shows the height a walker reaches on a long trail.



Which section of the graph shows the following?

The steepest positive gradient?

E

The shallowest positive gradient?

G

The steepest negative gradient?

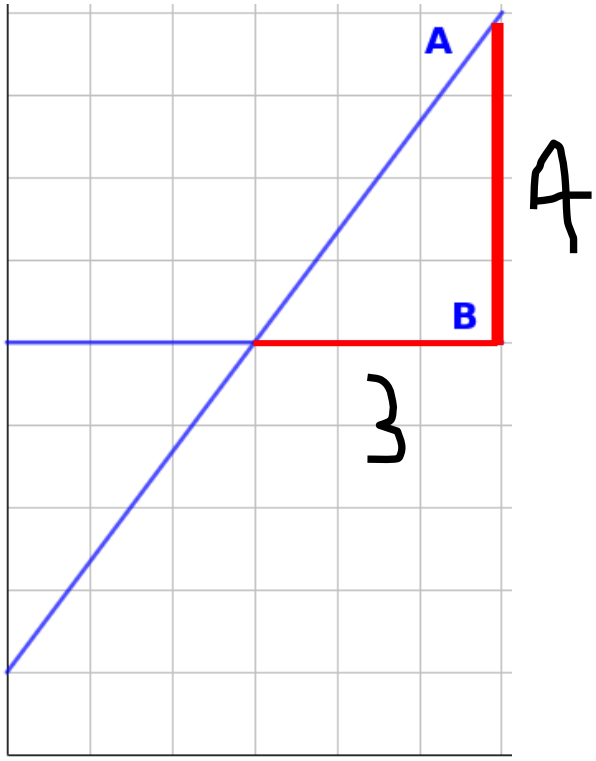
H

The shallowest negative gradient?

F

(4 marks)

3. Calculate the gradients of the lines A and B below.



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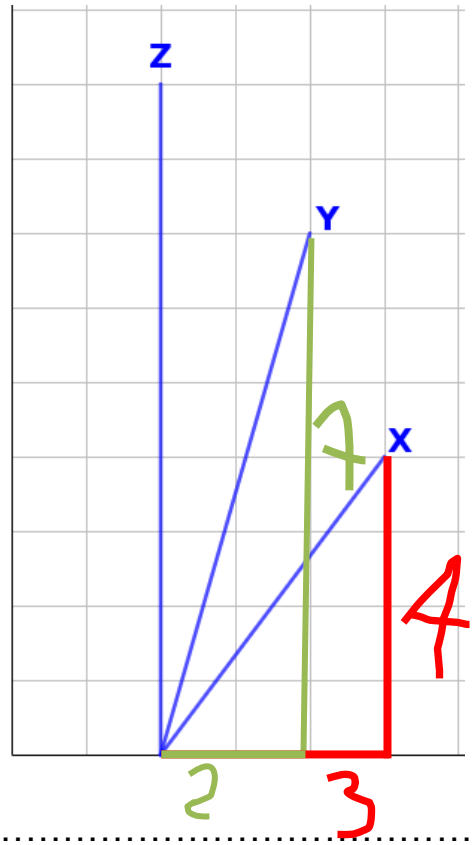
Gradient of A = $\frac{4}{3}$

Gradient of B = 0

(3 marks)

4. Calculate the gradients of lines X and Y below.



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Gradient of X = $\frac{4}{3}$

Gradient of Y = $\frac{7}{2} = 3.5$

Can the gradient of Z be calculated? Give your reasoning.

The gradient can't be calculated because the change in x is 0,
and we can't divide by 0.

(4 marks)

5. The points $(1,5)$ and $(8,7)$ are on the same straight line.
What is the gradient of the line?

$$gradient = \frac{change\ in\ y}{change\ in\ x} = \frac{7-5}{8-1} = \frac{2}{7}$$

Gradient = $\frac{2}{7}$

The points $(3,6)$ and $(7,-2)$ are on the same straight line.
What is the gradient of the line?

$$gradient = \frac{change\ in\ y}{change\ in\ x} = \frac{-2-6}{7-3} = \frac{-8}{4} = -2$$

Gradient = -2

(2 marks, 2 marks)

6. Points A (x, y) and B are on the same straight line.
The x-coordinate of B is three times the x-coordinate of A.
The y-coordinate of B is four times the y-coordinate of A.

What is the gradient of the line in terms of x and y?

$$A(x, y) \rightarrow B(3x, 4y)$$

$$gradient = \frac{change\ in\ y}{change\ in\ x} = \frac{4y-y}{3x-x} = \frac{3y}{2x}$$

Gradient = $\frac{3y}{2x}$

(3 marks)

7. A line D is parallel to the line C.
Two points on C are $(2,-2)$ and $(11,4)$.
$(3,2)$ is a point on D. Find another point on D.

Parallel lines have the same gradient, so Gradient of D = Gradient of C

$$Gradient\ of\ C = \frac{change\ in\ y}{change\ in\ x} = \frac{4--2}{11-2} = \frac{6}{9} = \frac{2}{3}$$

$$Gradient\ of\ D = \frac{2}{3}$$

$$Points\ on\ D = \left(3+n\ \ ,\ \ 2+\frac{2}{3}n\right)$$

For example:

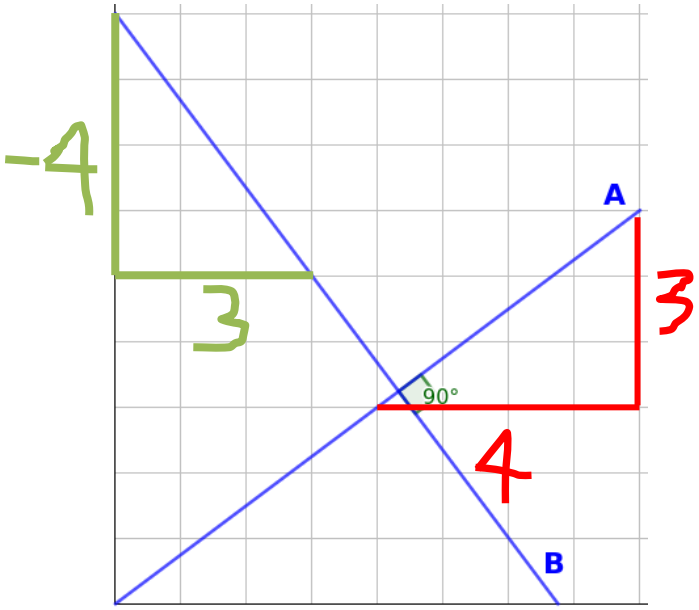
Point = (…6…), (…4…)

(3 marks)

8. A and B are two perpendicular lines with equations:

A: $y = mx$

B: $y = px + 9$



Calculate the gradients of A and B, then write down the equations of both lines.

$$Gradient\ of\ a = \frac{change\ in\ y}{change\ in\ x} = \frac{3}{4}$$

$$Gradient\ of\ B = \frac{change\ in\ y}{change\ in\ x} = -\frac{4}{3}$$

A: $\frac{3}{4}$

B: $-\frac{4}{3}$

Describe the relationship between the gradient of two perpendicular lines.

The product of gradients for perpendicular lines is -1

(3 marks, 1 mark)