



EXAM PAPERS PRACTICE

GCSE OCR Math J560

Equations of a line /

$$y = mx + c$$

Answers

*"We will help you to
achieve A Star "*



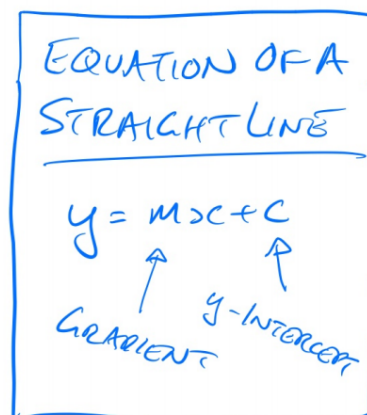
Answer 1

The equation of the line L_1 is $y = 3x - 2$
The equation of the line L_2 is $3y - 9x + 5 = 0$

Show that these two lines are parallel.

→ SAME GRADIENT

$$L_1: \text{GRADIENT: } \underline{m_1 = 3}$$



$$L_2: \quad 3y - 9x + 5 = 0$$
$$\quad \quad \quad +9x \quad -5 \quad \quad +9x \quad -5$$

$$\frac{3y}{3} = \frac{9x}{3} - \frac{5}{3}$$

$$y = 3x - \frac{5}{3}$$

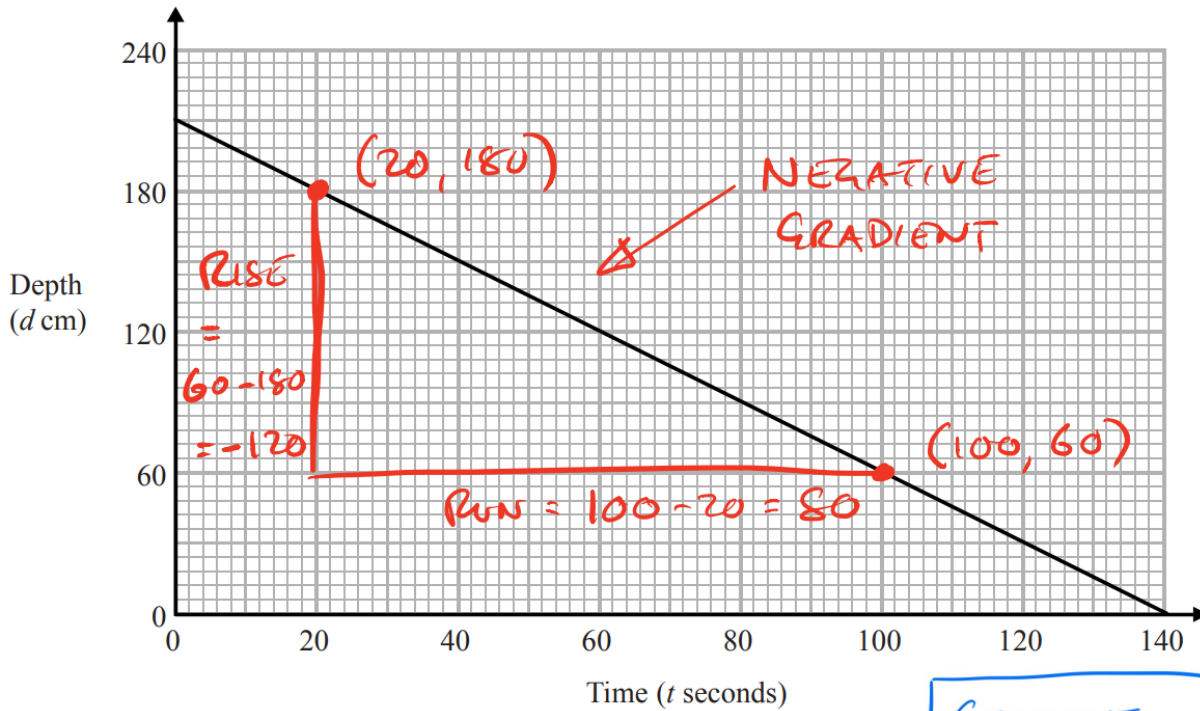
$$\text{GRADIENT: } \underline{m_2 = 3}$$

SINCE $m_1 = m_2$, L_1 AND L_2
ARE PARALLEL



Answer 2

The graph shows the depth, d cm, of water in a tank after t seconds.



(a) Find the gradient of this graph.

$$\begin{aligned} \text{GRADIENT} &= \frac{\text{RISE}}{\text{RUN}} = \frac{60 - 180}{100 - 20} \\ &= \frac{-120}{80} \\ &= \underline{\underline{-1.5 \text{ cm/s}}} \end{aligned}$$

GRADIENT

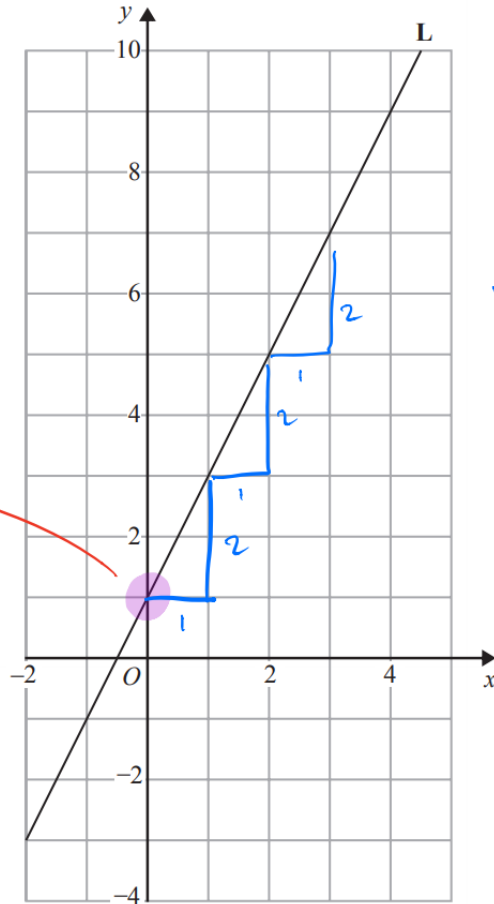
$$m = \frac{\text{RISE}}{\text{RUN}}$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

FOR TWO POINTS
 (x_1, y_1) AND (x_2, y_2)



Answer 3

Line L is drawn on the grid below.



"1 Across 2 Up"
SO $m = 2$

$c = 1$

Find the equation for the straight line L.
Give your answer in the form $y = mx + c$

EQN: $y = 2x + 1$

EQUATION OF A STRAIGHT LINE

$$y = mx + c$$

↑ ↑
GRADIENT y-INTERCEPT



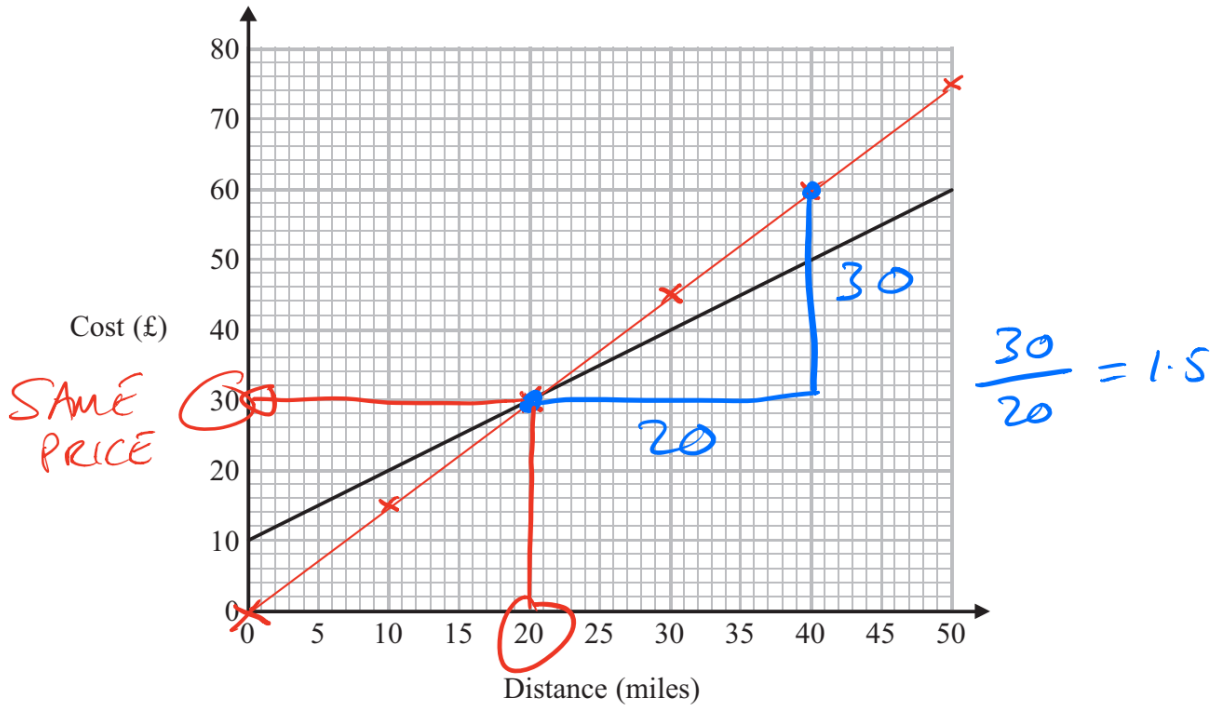
Answer 4

Bill uses his van to deliver parcels.

For each parcel Bill delivers there is a fixed charge plus £1.00 for each mile.

GRADIENT

You can use the graph to find the total cost of having a parcel delivered by Bill.



(a) How much is the fixed charge?

0 miles (y-intercept)

£ 10



Answer 5

(a) Complete the table of values for $y = 2x + 5$ STRAIGHT LINE

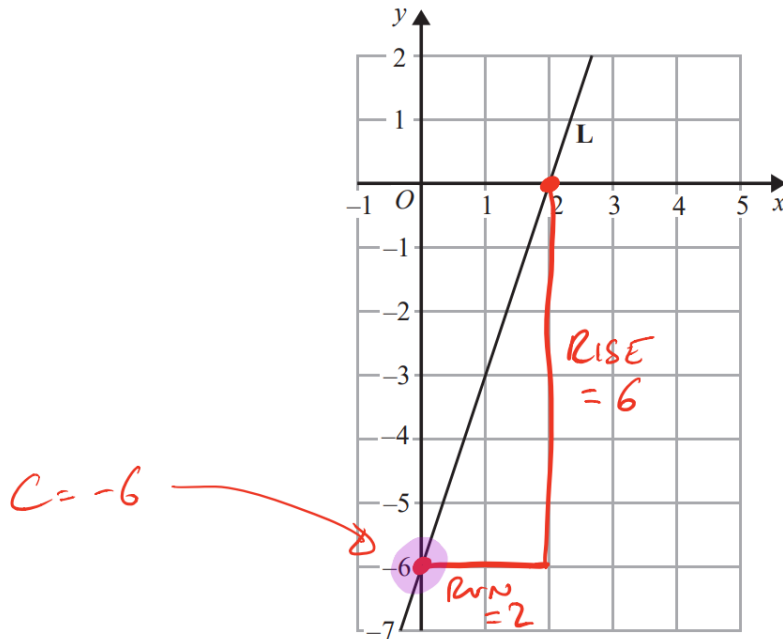
x	-2	-1	0	1	2
y	1	3	5	7	9

↖ ↖ ↖ ↖
+2 +2 +2 +2



Answer 6

The line L is shown on the grid.



Find an equation for L.

GRAD: $m = \frac{\text{RISE}}{\text{RUN}} = \frac{6}{2} = 3$

y-INT: $C = -6$

L: $y = 3x - 6$

EQUATION OF A STRAIGHT LINE

$$y = mx + c$$

↑ ↑
GRADIENT y-INTERCEPT

GRADIENT

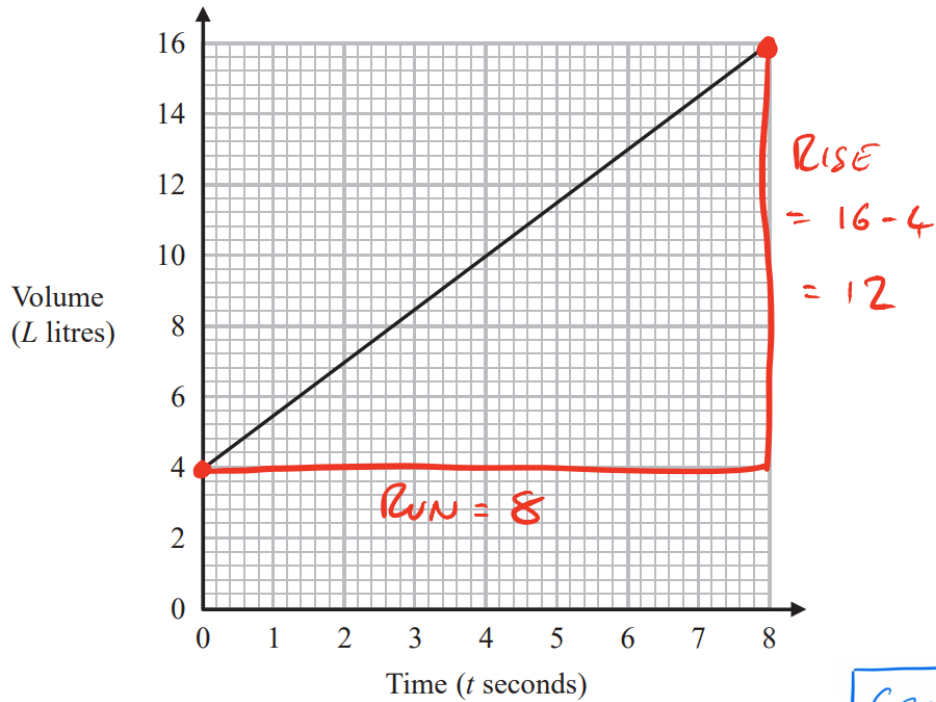
$$m = \frac{\text{RISE}}{\text{RUN}}$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

FOR TWO POINTS
(x_1, y_1) AND (x_2, y_2)



Answer 7

The graph shows the volume of liquid (L litres) in a container at time t seconds.



(a) Find the gradient of the graph.

$$\text{GRADIENT} = \frac{\text{RISE}}{\text{RUN}} = \frac{12}{8} = \underline{\underline{1.5}}$$

GRADIENT

$$m = \frac{\text{RISE}}{\text{RUN}}$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

FOR TWO POINTS
 (x_1, y_1) AND (x_2, y_2)



Answer 8

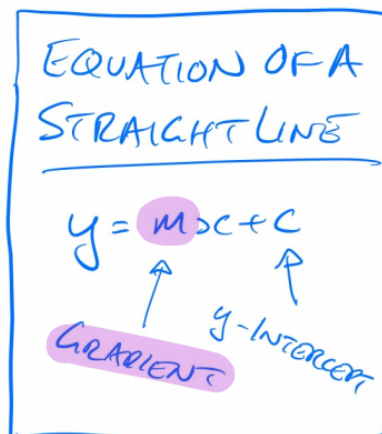
Here are the equations of four straight lines.

- Line A $y = 2x + 4$
- Line B $2y = x + 4$
- Line C $2x + 2y = 4$
- Line D $2x - y = 4$

Two of these lines are parallel.

Write down the two parallel lines?

→ "SAME GRADIENT"



A: $y = 2x + 4 \rightarrow m = 2$

B: $\frac{2y}{2} = \frac{x}{2} + \frac{4}{2}$
 $y = \frac{1}{2}x + 2 \rightarrow m = \frac{1}{2}$

C: $2x + 2y = 4$
 $\quad -2x \quad -2x$
 $\frac{2y}{2} = \frac{-2x + 4}{2}$
 $y = -x + 2 \rightarrow m = -1$

D: $2x - y = 4$
 $\quad -2x \quad -2x$
 $-y = -2x + 4$
 $(x-1) \quad y = 2x - 4 \rightarrow m = 2$

Line A and line D



Answer 9

A and B are straight lines.

Line A has equation $2y = 3x + 8$

Line B goes through the points $(-1, 2)$ and $(2, 8)$

Do lines A and B intersect?
You must show all your working.

→ YES UNLESS THEY ARE PARALLEL...

LINE A

$$\frac{2y}{2} = \frac{3x + 8}{2}$$

$$y = 1.5x + 4$$

GRADIENT = 1.5

$y = mx + c$
↑ GRADIENT ↓ y-INTERCEPT

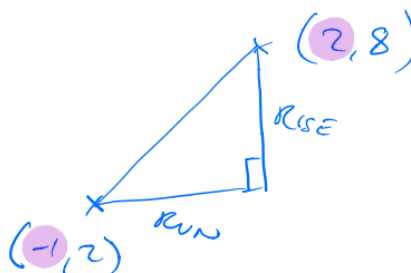
LINE B

$$\text{GRADIENT} = \frac{\text{RISE}}{\text{RUN}}$$

$$= \frac{8 - 2}{2 - (-1)}$$

$$= \frac{6}{3}$$

$$= \underline{\underline{2}}$$



GRADIENTS ARE DIFFERENT SO THEY ARE NOT PARALLEL AND THEY INTERSECT.



Answer 11

L_1 and L_2 are parallel lines.

→ "SAME GRADIENT"

The equation of L_1 is $y = 3x + 2$

L_2 passes through the point $(3, 4)$.

Find an equation for L_2 .

$$L_2: m = 3 \text{ (same as } L_1)$$

$$\text{EQN: } y = 3x + c$$

$$x=3, y=4 \Rightarrow 4 = 3 \times 3 + c$$

$$4 = 9 + c$$

$$-9 \quad -9$$

$$-5 = c$$

$$\text{EQN OF } L_2: \underline{y = 3x - 5}$$

EQUATION OF A STRAIGHT LINE

$$y = mx + c$$

↑ ↑
GRADIENT y-Intercept



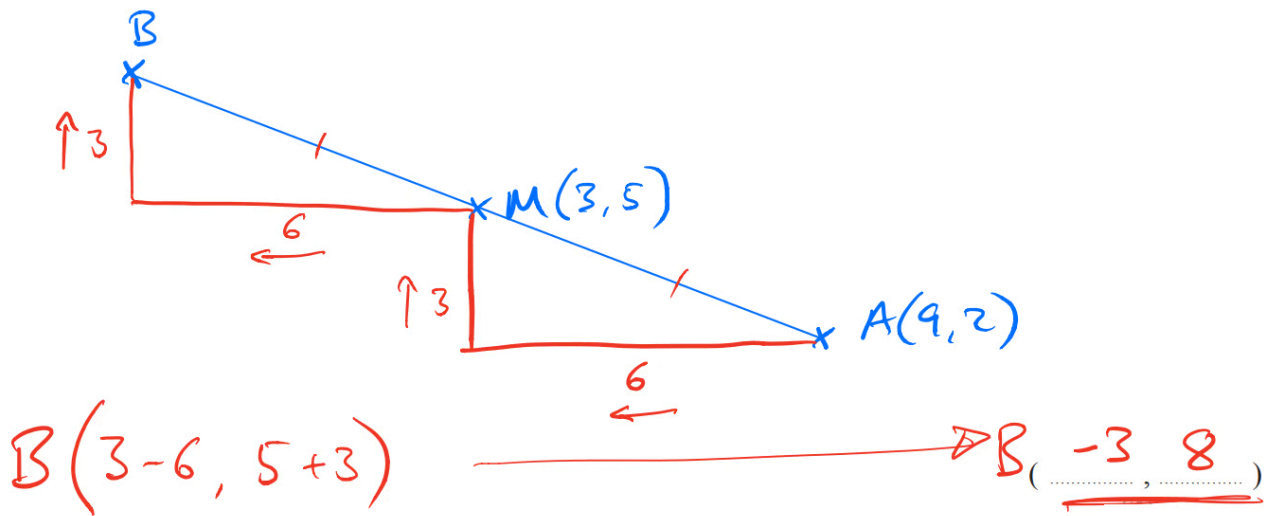
Answer 12

AB is a line segment.

The midpoint of the line segment AB has coordinates $(3, 5)$

Point A has coordinates $(9, 2)$

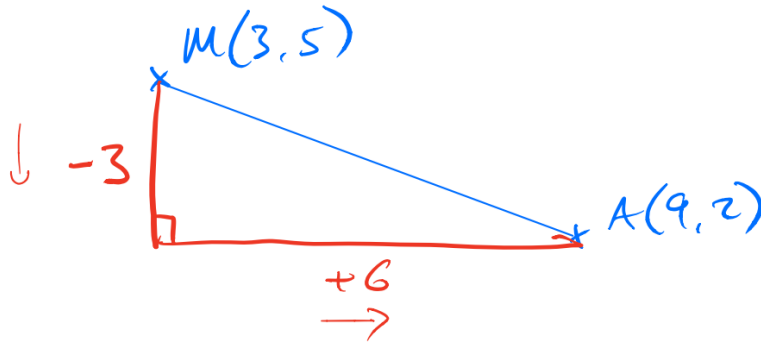
(a) Work out the coordinates of point B .





Answer 13

(b) Work out an equation of the straight line that passes through (9, 2) and (3, 5)



$$m = \frac{\text{RISE}}{\text{RUN}} = \frac{-3}{6} = -\frac{1}{2}$$

EQN: $y = -\frac{1}{2}x + c$

$x=3, y=5:$ $5 = -\frac{1}{2} \times 3 + c$

$$5 = -1.5 + c$$

$$6.5 = c$$

EQN: $y = -0.5x + 6.5$

EQUATION OF A STRAIGHT LINE

$$y = mx + c$$

↑ ↑
GRADIENT y-INTERCEPT

GRADIENT

$$m = \frac{\text{RISE}}{\text{RUN}}$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

FOR TWO POINTS
(x_1, y_1) AND (x_2, y_2)



Answer 14

On the grid, draw the graph of $y = 2x - 3$ for values of x from -2 to 3

x	-2	-1	0	1	2	3
y	-7	-5	-3	-1	1	3

(I'VE USED
THE TABLE
FUNCTION ON
MY CALCULATOR.)

