



EXAM PAPERS PRACTICE

GCSE OCR Math J560

Coordinates

Answers

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



Answer 1

P is the point $(-4, 4)$

Q is the point $(1, -5)$

(b) Find the gradient of PQ .

$$\text{GRADIENT (} = \frac{\text{RISE}}{\text{RUN}} \text{) IS}$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{GRADIENT} = \frac{-9}{5}$$
$$= \underline{\underline{-1.8}}$$

Answer 2

The point A has coordinates $(2, 3)$.

The point B has coordinates $(6, 8)$.

M is the midpoint of the line AB .

Find the coordinates of M .

MIDPOINT IS THE
"AVERAGE POINT"

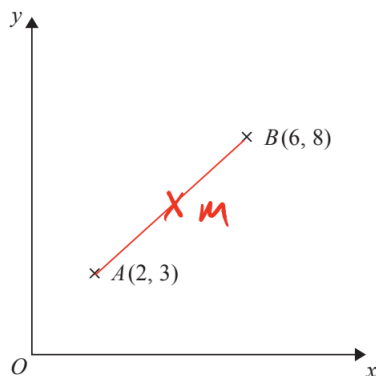


Diagram **NOT**
accurately drawn

$$M \left(\frac{2+6}{2}, \frac{3+8}{2} \right)$$

$$\text{So } \underline{\underline{M(4, 5.5)}}$$



EXAM PAPERS PRACTICE

Answer 3

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

$P(-4, 4)$

$A(-1, 2)$

$B(7, 5)$

Diagram NOT
accurately drawn

$$\begin{aligned} -5 - 4 \\ = -9 \end{aligned}$$

DOWN -VE GRADIENT

$$\begin{aligned} 1 - (-4) \\ = 5 \end{aligned}$$

MIDPOINT $\left(\frac{-1+7}{2}, \frac{2+5}{2}\right)$

$$\left(\frac{6}{2}, \frac{7}{2}\right)$$

$$\left(\underline{\underline{3}}, \underline{\underline{3.5}}\right)$$

A is the point $(-1, 2)$

B is the point $(7, 5)$

(a) Find the coordinates of the midpoint of AB.

MIDPOINT IS $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
I.E. THE AVERAGE POINT



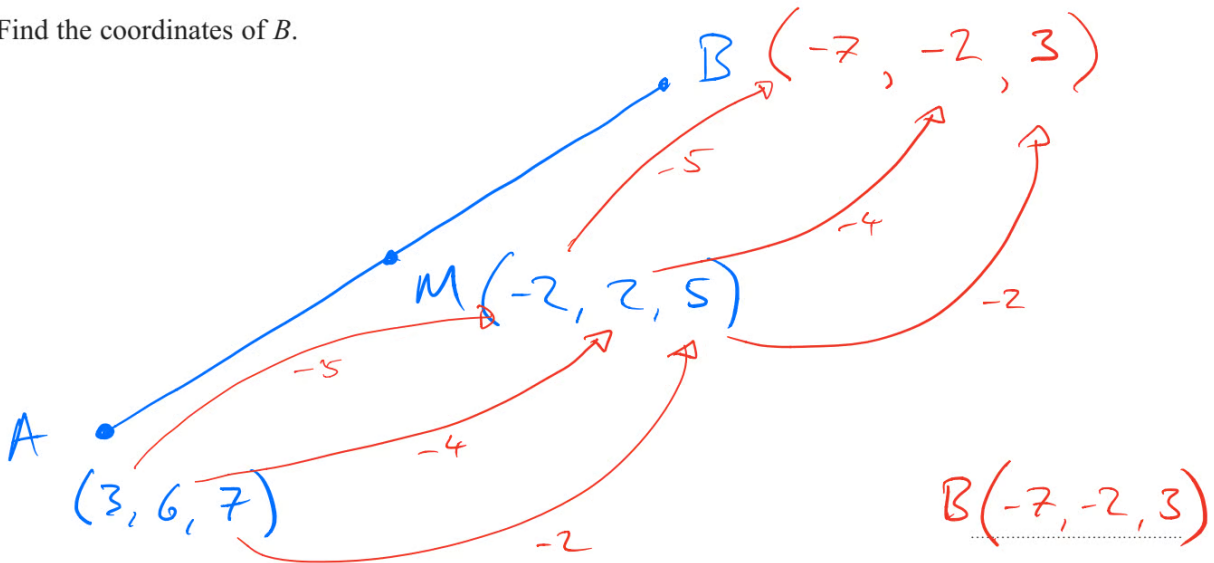
Answer 4

AB is a line segment.

A is the point with coordinates $(3, 6, 7)$.

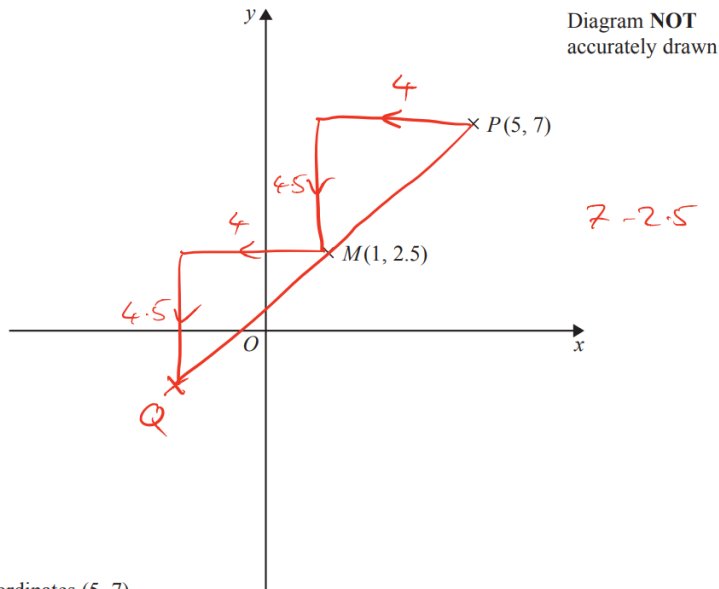
The midpoint of AB has coordinates $(-2, 2, 5)$.

Find the coordinates of B .





Answer 5



Point P has coordinates $(5, 7)$.
Point M has coordinates $(1, 2.5)$.

Point M is the midpoint of the line PQ .

Find the coordinates of point Q .

$$Q: x = 1 - 4 = -3$$

$$y = 2.5 - 4.5 = -2$$

$$\underline{\underline{Q(-3, -2)}}$$



Answer 6

A and B are two points.

Point A has coordinates $(-2, 4)$.

Point B has coordinates $(8, 9)$.

C is the midpoint of the line segment AB .

(a) Find the coordinates of C .

$$C \left(\frac{-2+8}{2}, \frac{4+9}{2} \right)$$

so $C \left(\frac{6}{2}, \frac{13}{2} \right)$

$$\underline{\underline{C \left(3, \frac{13}{2} \right)}}$$

MIDPOINT
(AVERAGE POINT)
OF (x_1, y_1) AND (x_2, y_2)
IS $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2} \right)$



Answer 7

The points A , B and C lie in order on a straight line.

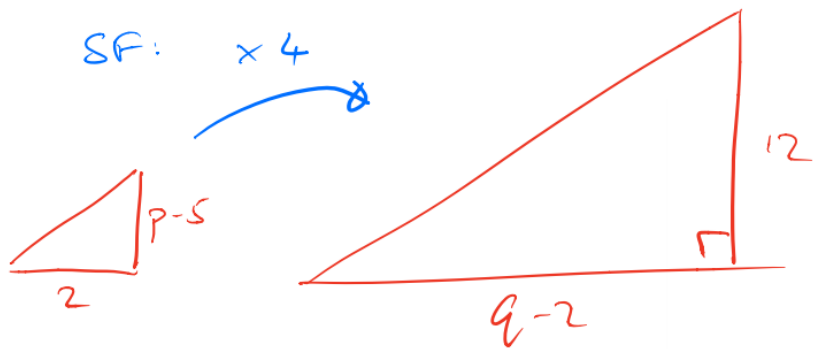
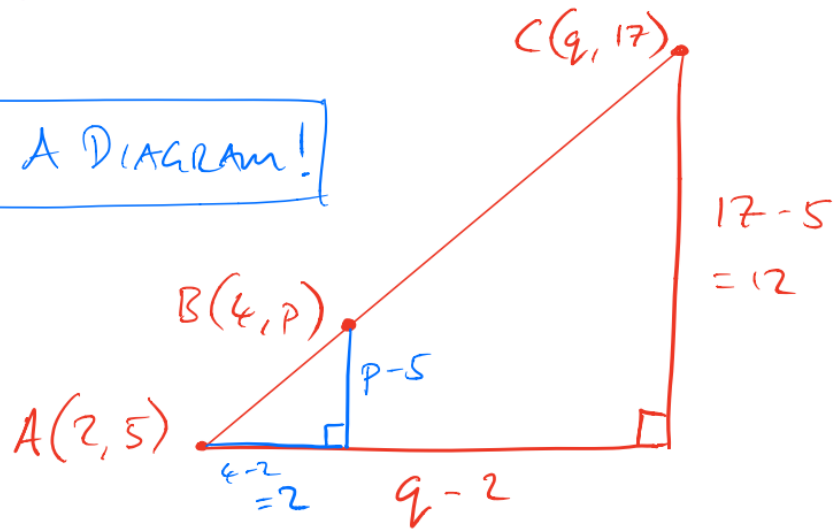
The coordinates of A are $(2, 5)$

The coordinates of B are $(4, p)$

The coordinates of C are $(q, 17)$

Given that $AC = 4AB$, find the values of p and q .

Draw A Diagram!



VERT:

$$\frac{12}{4} = \frac{4 \times (p-5)}{4}$$

$$3 = p-5$$
$$+5 \quad +5$$

$$\underline{\underline{8 = p}}$$

HORIZ:

$$q-2 = 4 \times 2$$
$$+2 \quad +2$$

$$\underline{\underline{q = 10}}$$



Answer 8

A triangle has vertices P , Q and R .

The coordinates of P are $(-3, -6)$

The coordinates of Q are $(1, 4)$

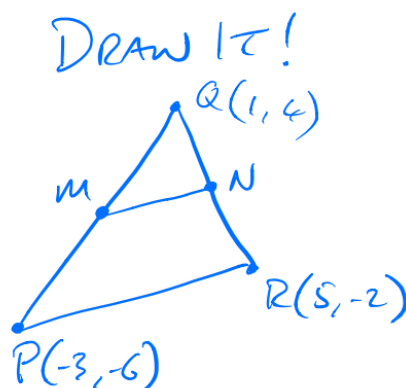
The coordinates of R are $(5, -2)$

M is the midpoint of PQ .

N is the midpoint of QR .

Prove that MN is parallel to PR .

You must show each stage of your working.



MIDPOINT OF PQ :

$$M\left(\frac{-3+1}{2}, \frac{-6+4}{2}\right) = \underline{\underline{M(-1, -1)}}$$

MIDPOINT OF QR :

$$N\left(\frac{1+5}{2}, \frac{4-2}{2}\right) = \underline{\underline{N(3, 1)}}$$

$$\text{GRAD}_{MN} = \frac{1-(-1)}{3-(-1)} = \frac{2}{4} = \underline{\underline{\frac{1}{2}}}$$

$$\text{GRAD}_{PR} = \frac{-2-(-6)}{5-(-3)} = \frac{4}{8} = \underline{\underline{\frac{1}{2}}}$$

<p>MIDPOINT (AVERAGE POINT) OF (x_1, y_1) AND (x_2, y_2) IS $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$</p>

<p>GRADIENT</p> $m = \frac{\text{RISE}}{\text{RUN}}$ $m = \frac{y_2 - y_1}{x_2 - x_1}$ <p>FOR TWO POINTS (x_1, y_1) AND (x_2, y_2)</p>

SAME GRADIENT THEREFORE

MN IS PARALLEL TO PR



Answer 9

Here is a cuboid drawn on a 3-D grid.

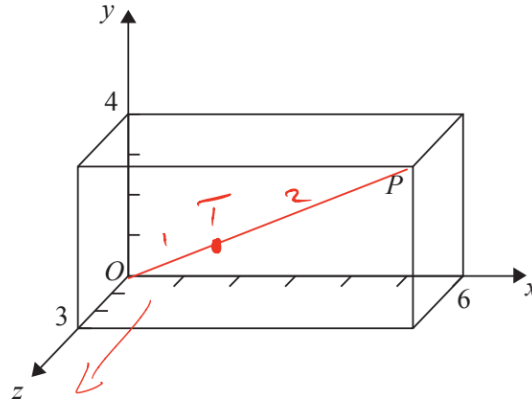


Diagram NOT accurately drawn

P is a vertex of the cuboid.

T divides the line OP in the ratio 1 : 2

Find the coordinates of T .

$$P(6, 4, 3)$$

T WILL HAVE COORDS WHICH ARE $\frac{1}{3}$ OF P 'S.

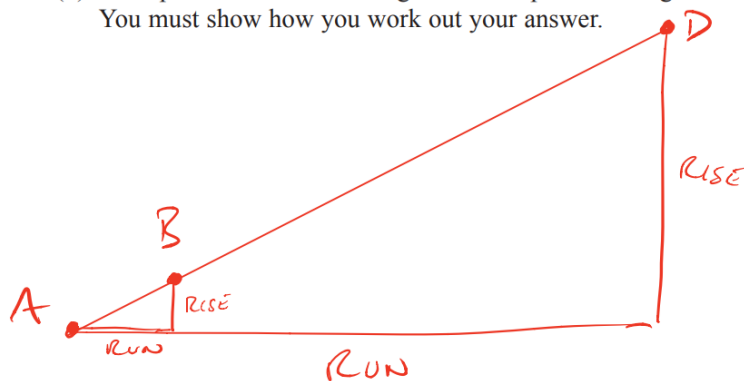
$$\left(\underline{\underline{2}}, \underline{\underline{\frac{4}{3}}}, \underline{\underline{1}} \right)$$



Answer 10

D is the point with coordinates $(100, 56)$.

- *(b) Does point D lie on the straight line that passes through A and B ?
You must show how you work out your answer.



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)

IF D LIES ON AB THEN

GRADIENT OF AD = GRADIENT OF AB .

$$\text{GRAD}_{AD} = \frac{56 - 4}{100 - -2}$$

$$\text{GRAD}_{AB} = \frac{9 - 4}{8 - -2}$$

$$= \frac{52}{102} = \frac{26}{51}$$

$$= \frac{5}{10} = \frac{1}{2}$$

GRADIENTS ARE DIFFERENT SO D DOES NOT LIE ON AB



Answer 11

Q , R and S are points on a grid.

Q is the point with coordinates $(106, 103)$

R is the point with coordinates $(106, 105)$

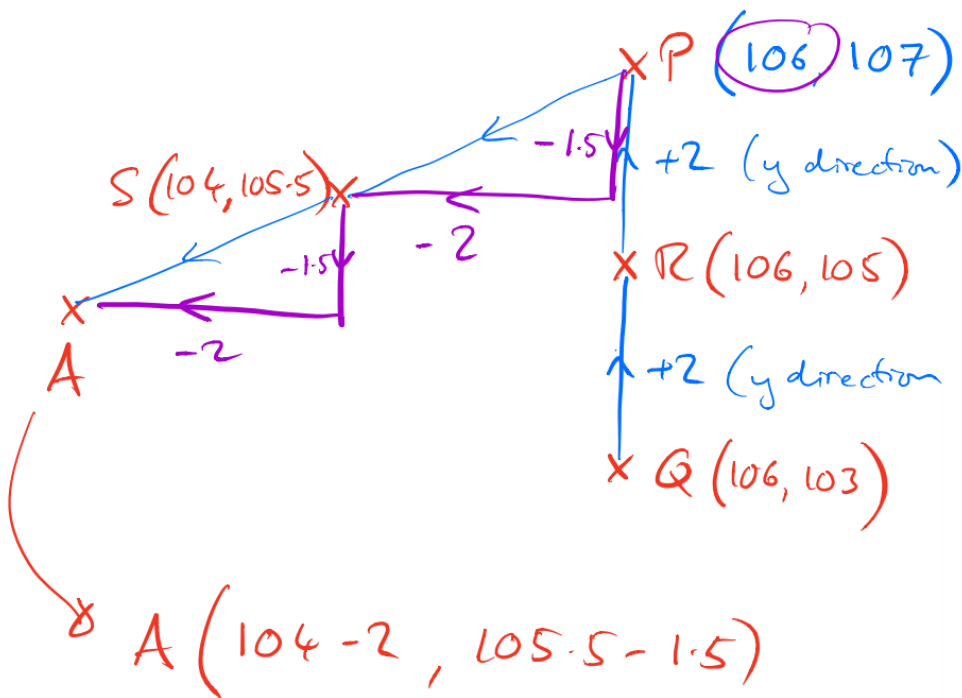
S is the point with coordinates $(104, 105.5)$

P and A are two other points on the grid such that

R is the midpoint of PQ

S is the midpoint of PA

Work out the coordinates of the point A .



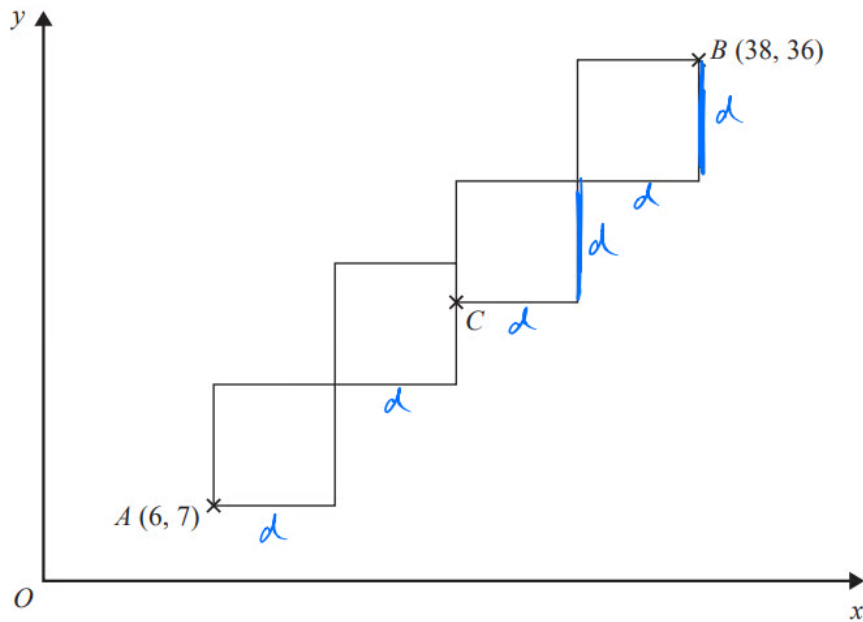
So $A(102, 104)$



Answer 12

A pattern is made from four identical squares.

The sides of the squares are parallel to the axes.



Point A has coordinates (6, 7)

Point B has coordinates (38, 36)

Point C is marked on the diagram.

Work out the coordinates of C.

x coord : $4d = 38 - 6$

$$\frac{4d}{4} = \frac{32}{4}$$

$$\underline{d = 8}$$

$$x \text{ Coord} = 6 + 2 \times 8$$

$$= \underline{\underline{22}}$$

y Coord

$$y \text{ Coord} = 36 - 8 - 8$$

$$= \underline{\underline{20}}$$

$$\underline{\underline{(22, 20)}}$$