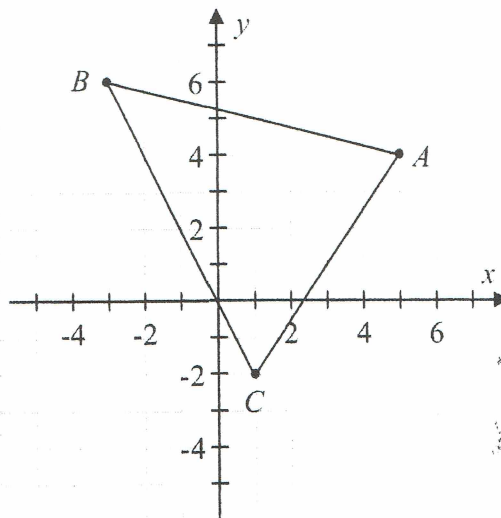


The diagram shows the triangle ABC .
The co-ordinates of the point A are $(5, 4)$.



(a) Write down the co-ordinates of the points:

B (,)

C (,)

(b) (i) On the diagram, mark the point M ,
the midpoint of $[AB]$.

(ii) Use a formula to find the co-ordinates of M .

(c) Use a formula to find the length of $[BC]$, the longest side of the triangle.

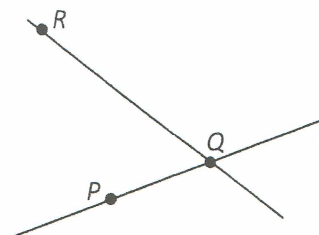
Question 2

(25 marks)

The diagram shows the line PQ and the line QR .

The co-ordinates of the points are $P(4, 2)$, $Q(8, 5)$ and $R(2, 11)$.

- (a) Find the slope of PQ .



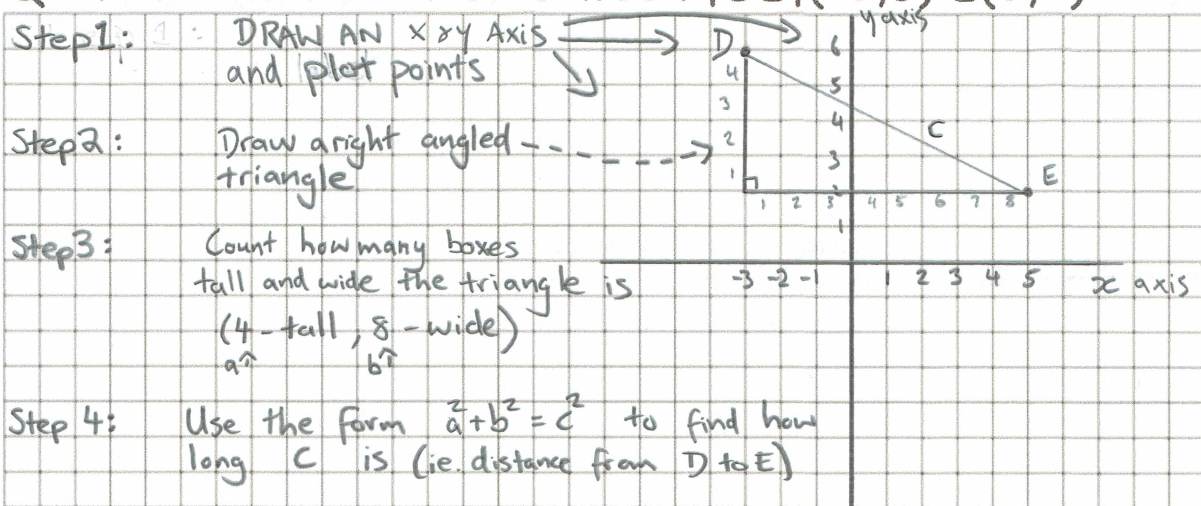
- (b) Write down the slope of any line perpendicular to PQ .

Slope =

- (c) Find the area of the triangle PQR .

Example Answer:

Q1: Find the distance between $|DE|$ $D(-3,6)$ $E(5,2)$



$$a = 4 \quad b = 8 \quad c = ?$$

$$4^2 + 8^2 = c^2$$

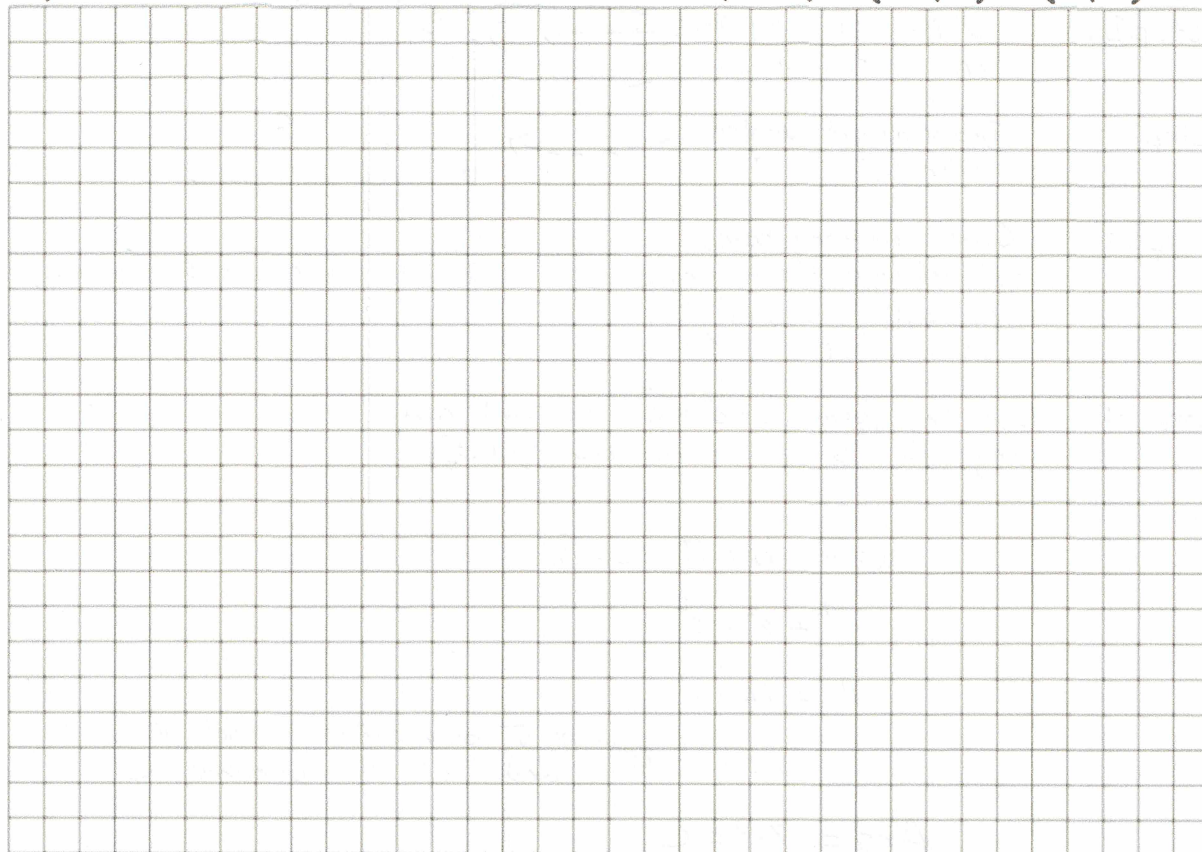
$$16 + 64 = c^2$$

$$\sqrt{80} = \sqrt{c^2} \quad \leftarrow \text{we } \sqrt{\text{both sides to get rid of } ^2 \text{ and } c^2 \text{ will become } c}$$

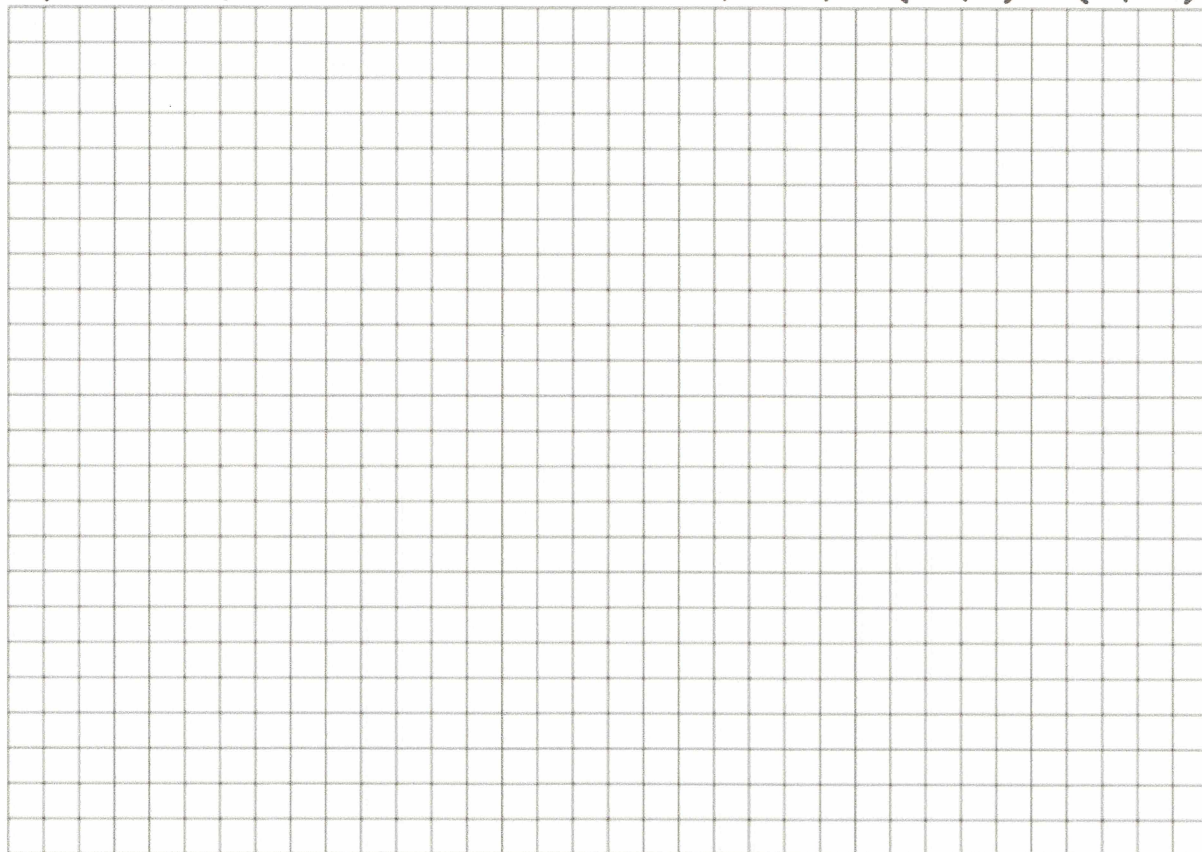
$$\text{Ans} = 8.9 = c$$

Q2: Find the distance between $|PQ|$ $P(-3,-5)$ $Q(5,2)$

Q3: Find the distance between $|YZ|$ $Y(-5,2)$ $Z(5,8)$



Q4: Find the distance between $|MN|$ $M(-2,3)$ $N(4,-4)$



Q5: Find the midpoint between $D(-3, 6)$ and $E(5, 2)$

Step 1 : Copy down the formula from logbook

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Step 2: Label your coordinates

$D(-3, 6)$ $E(5, 2)$ ← X comes before Y

Step 3: Draw out template

$$\left(\frac{+}{2}, \frac{+}{2} \right)$$

Step 4: Fill it out

$$\left(\frac{-3+5}{2}, \frac{6+2}{2} \right)$$

Step 5: Add the numbers on top
then divide by two

$$\left(\frac{2}{2}, \frac{8}{2} \right)$$

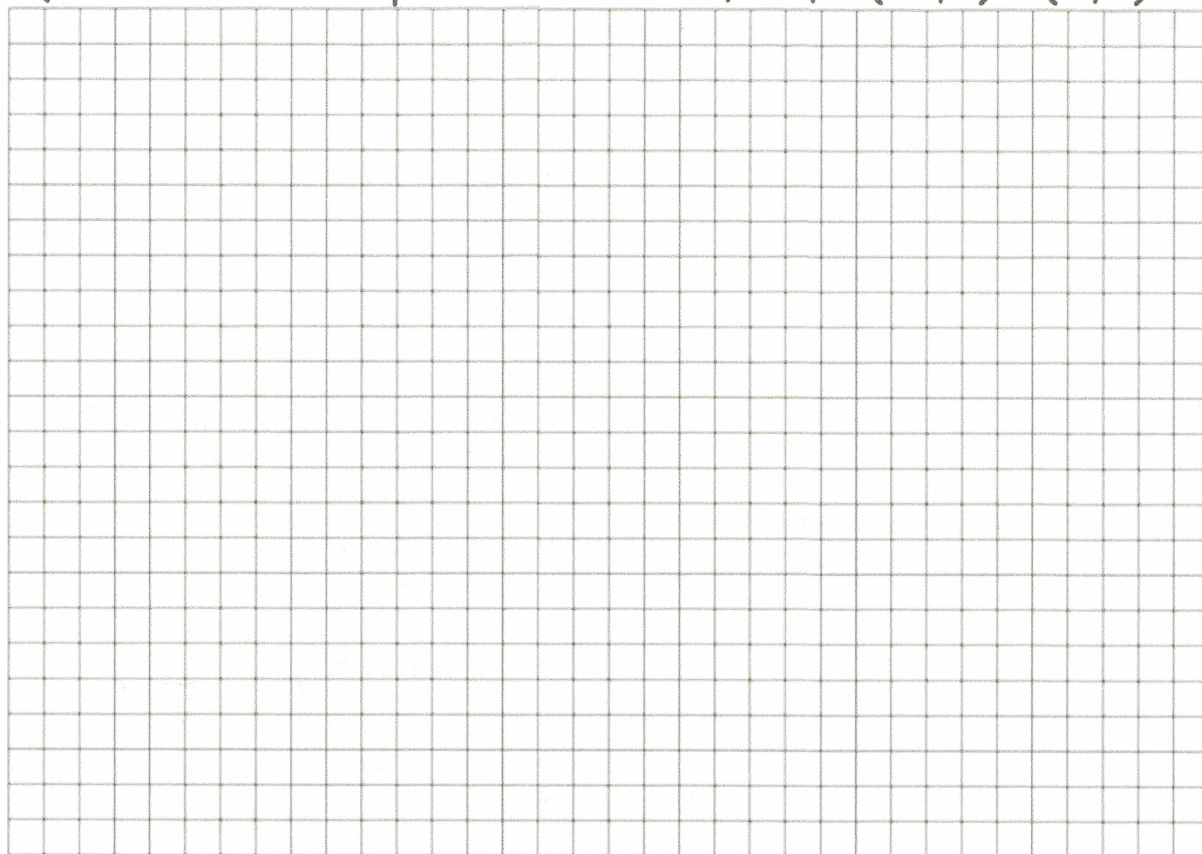
$(1, 4)$

Ans = (1, 4) ← This is the midpoint.

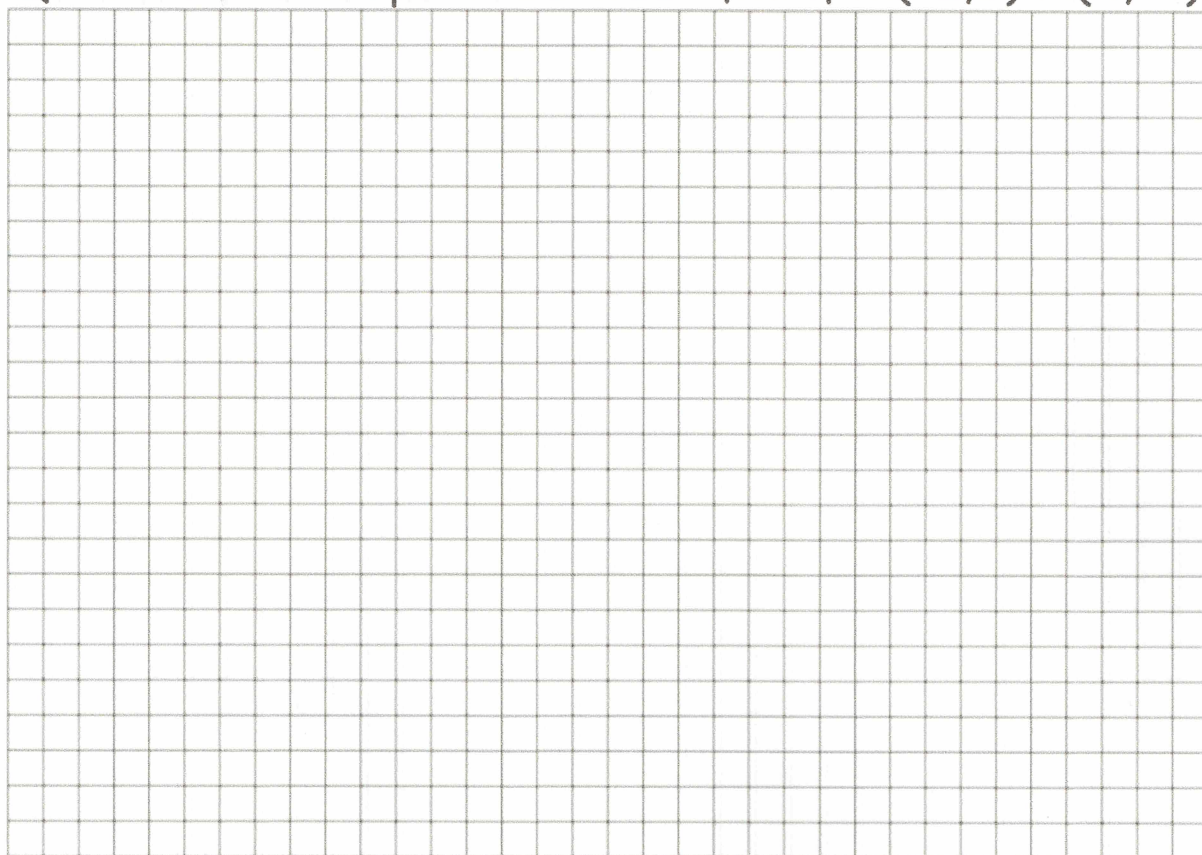
Q6: Find the midpoint between PQ | $P(-3, -5)$ $Q(5, 2)$

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, dark lines. There are no margins, text, or other markings on the page.

Q7: Find the midpoint between $|YZ|$ $Y(-5,2)$ $Z(5,8)$



Q8: Find the midpoint between $|MN|$ $M(-2,3)$ $N(4,-4)$



Q9: Find the slope of the line $|DE|$ $D(-3,6)$ $E(5,2)$

Step 1: Draw an x & y axis

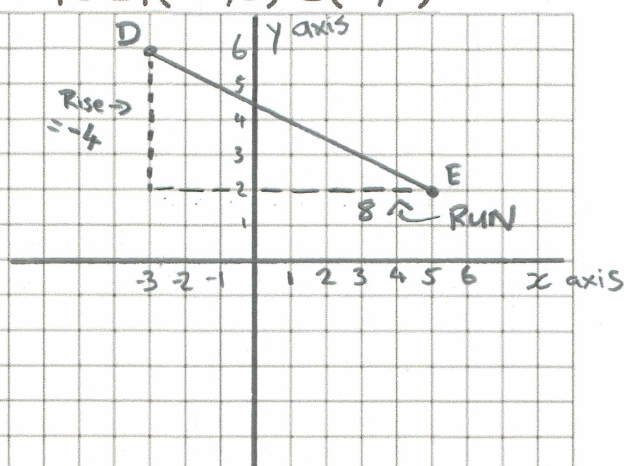
Step 2: Plot your points and draw a line between them

Step 3: Work out the "Rise"
if the line is $\nearrow$ it is positive +

if the line is $\searrow$ it is negative -

Step 4: Work out the Run
(how long is it?)

STEP 5: Put the rise over the run
and simplify

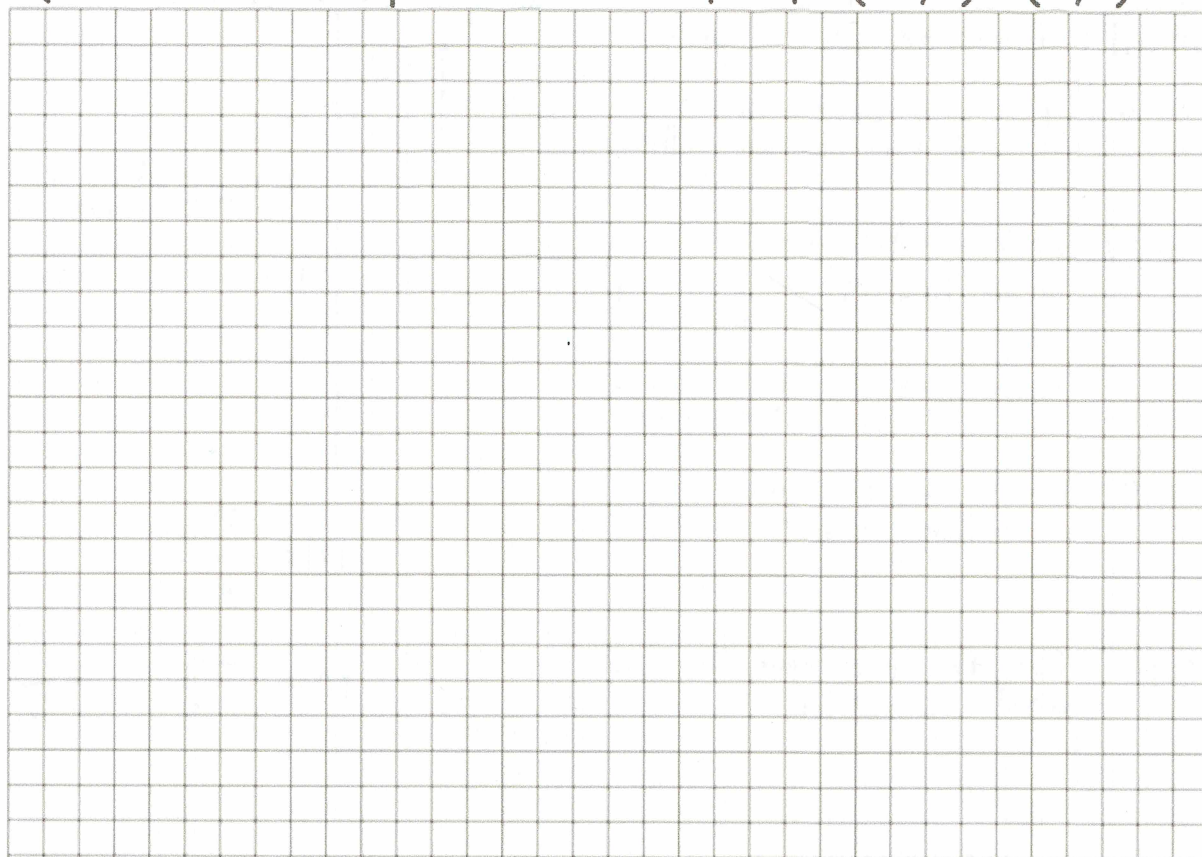


$$m = \frac{\text{Rise}}{\text{Run}}$$

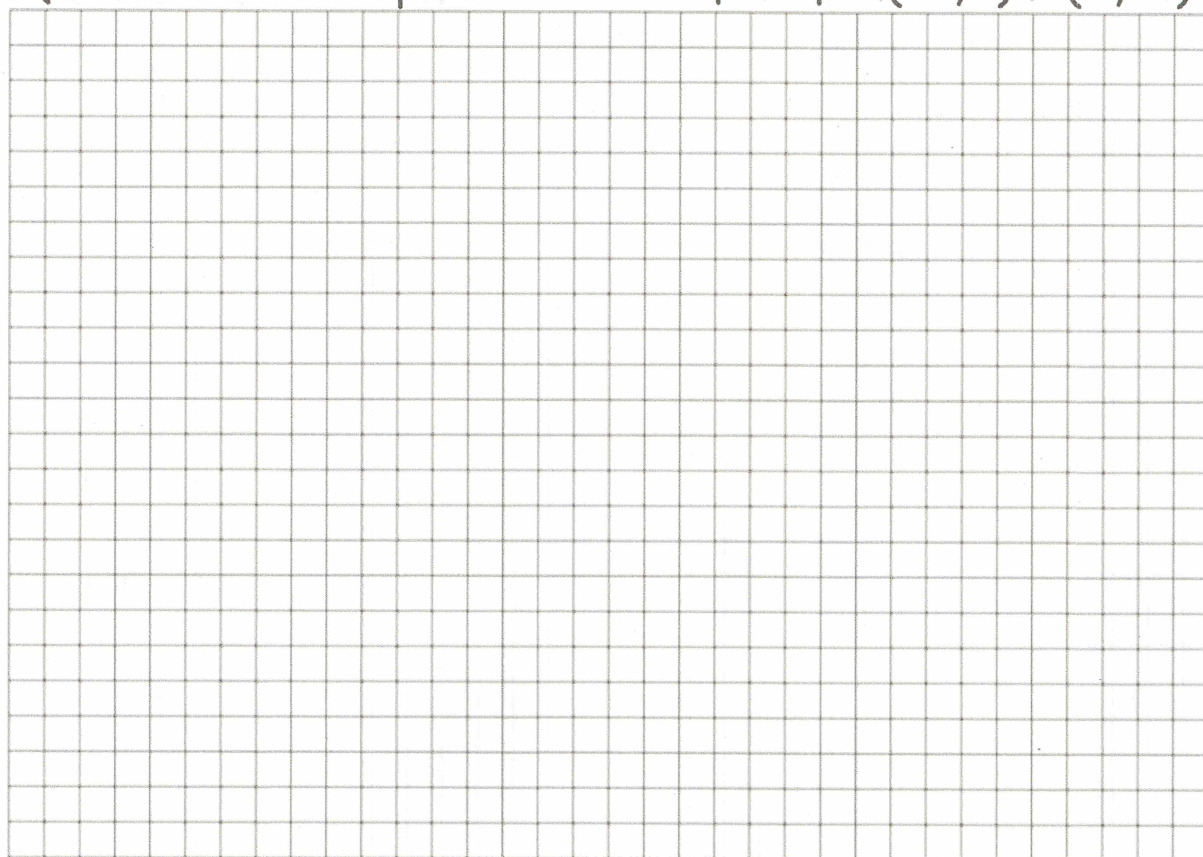
$$m = \frac{-4}{8} \text{ or } -\frac{1}{2}$$

Q10: Find the slope of the line $|PQ|$ $P(-3,-5)$ $Q(5,2)$

Q11: Find the slope of the line $|YZ|$ $Y(-5,2)$ $Z(5,8)$



Q12: Find the slope of the line $|MN|$ $M(-2,3)$ $N(4,-4)$



Q1: Find the area of the $\triangle ABC$ A(4,4)B(2,5)C(0,0)

Step 1: Is one of the co-ordinates at (0,0)?
yes? Then move on to step 2.

$$\frac{1}{2} |x_1 y_2 - x_2 y_1|$$

Step 2: Write out the formula

Step 3: Use "the trick" to fill out
the formula (put the co-ordinates
above one another)

$$\begin{array}{c} (4, 4) \\ \times \\ (2, 5) \end{array}$$

Step 4: Fill out the formula

$$\frac{1}{2} |(4)(5) - (4)(2)|$$

Step 5: Do the sums inside the brackets
and then divide by 2 (i.e. multiply
by $\frac{1}{2}$)

$$\frac{1}{2} |20 - 8|$$

$$\frac{1}{2} |12|$$

$$\text{Ans} = 6 \text{ units}^2$$

Q2: Find the area of the $\triangle DEF$ D(3,-3)E(7,4)F(0,0)

Q3: Find the area of the $\triangle PQR$ $P(-2,3)Q(-6,-2)R(2,1)$

STEP 1: Is one of the co-ordinates at $(0,0)$?

No? Then we have to translate the points.

$P(-2,3)$ $Q(-6,-2)$ $R(2,1)$

$-2 \downarrow -1$

$-2 \downarrow -1$

$-2 \downarrow -1$

$(-4,2)$

$(-8,-3)$

$(0,0)$

now we can use these points

STEP 2: Use the criss-cross method ("the trick") $\rightarrow$

$(-4,2)$

$(-8,-3)$

STEP 3: Fill out the formula

$$\frac{1}{2} | (-4)(-3) - (2)(-8) |$$

STEP 4: Do the sums inside the brackets
and then divide by 2 (i.e. multiply
by $\frac{1}{2}$)

$$\frac{1}{2} | 12 + 16 |$$

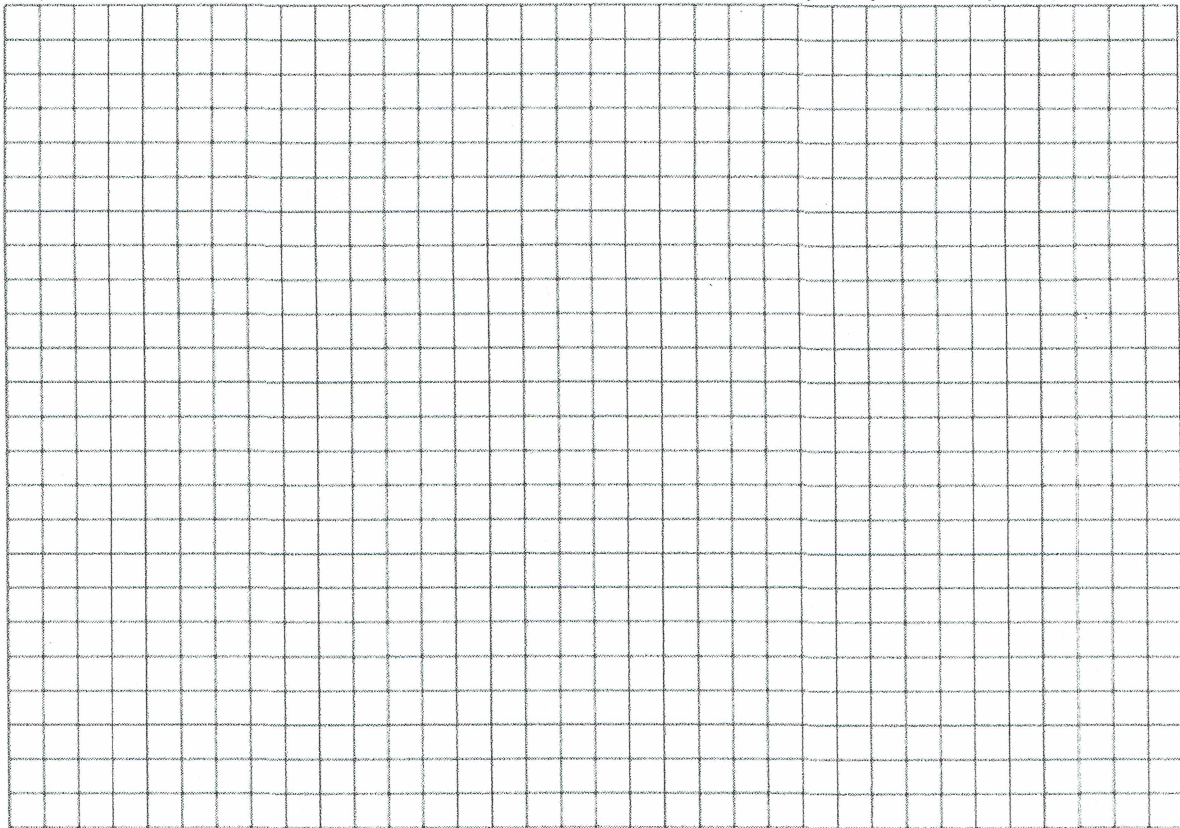
$$\frac{1}{2} | 28 |$$

be careful
of the minus
numbers

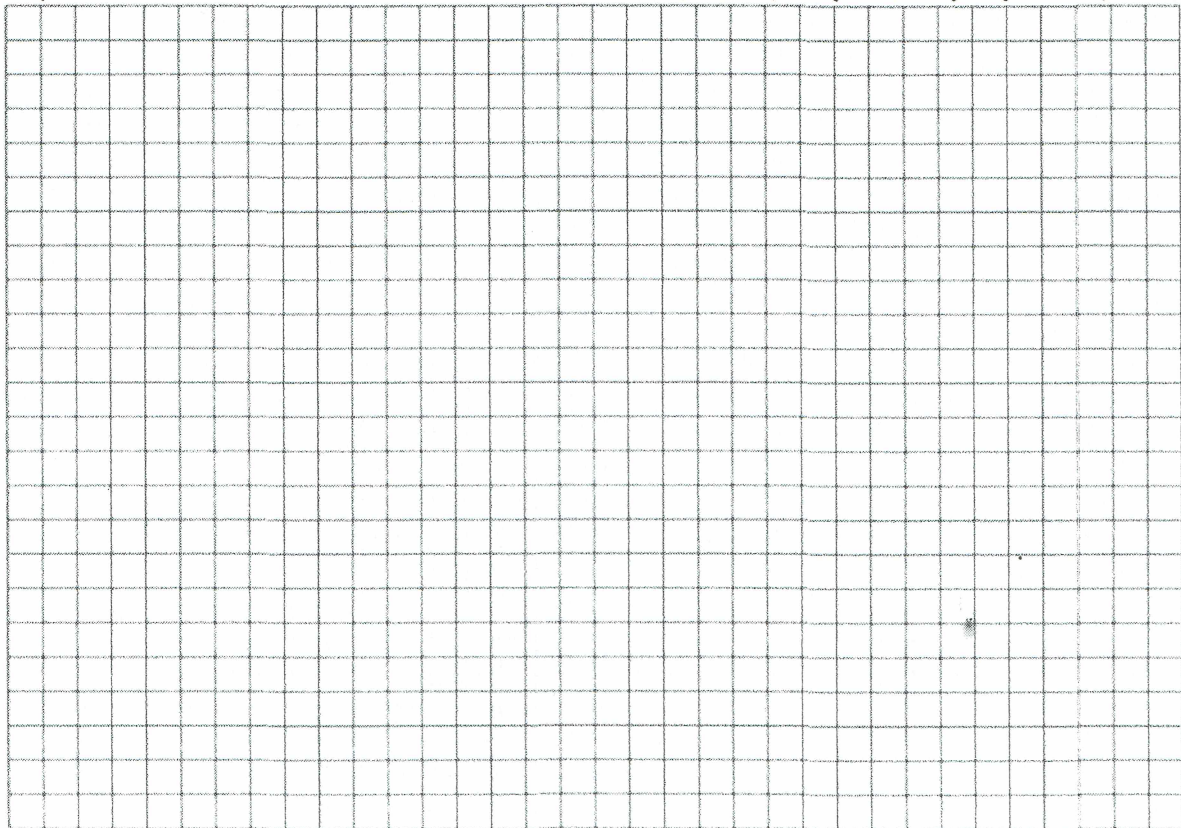
$$\text{Ans} = \underline{\underline{14 \text{ units}^2}}$$

Q4: Find the area of the $\triangle XYZ$ $X(-1,-2)Y(0,-5)Z(6,-2)$

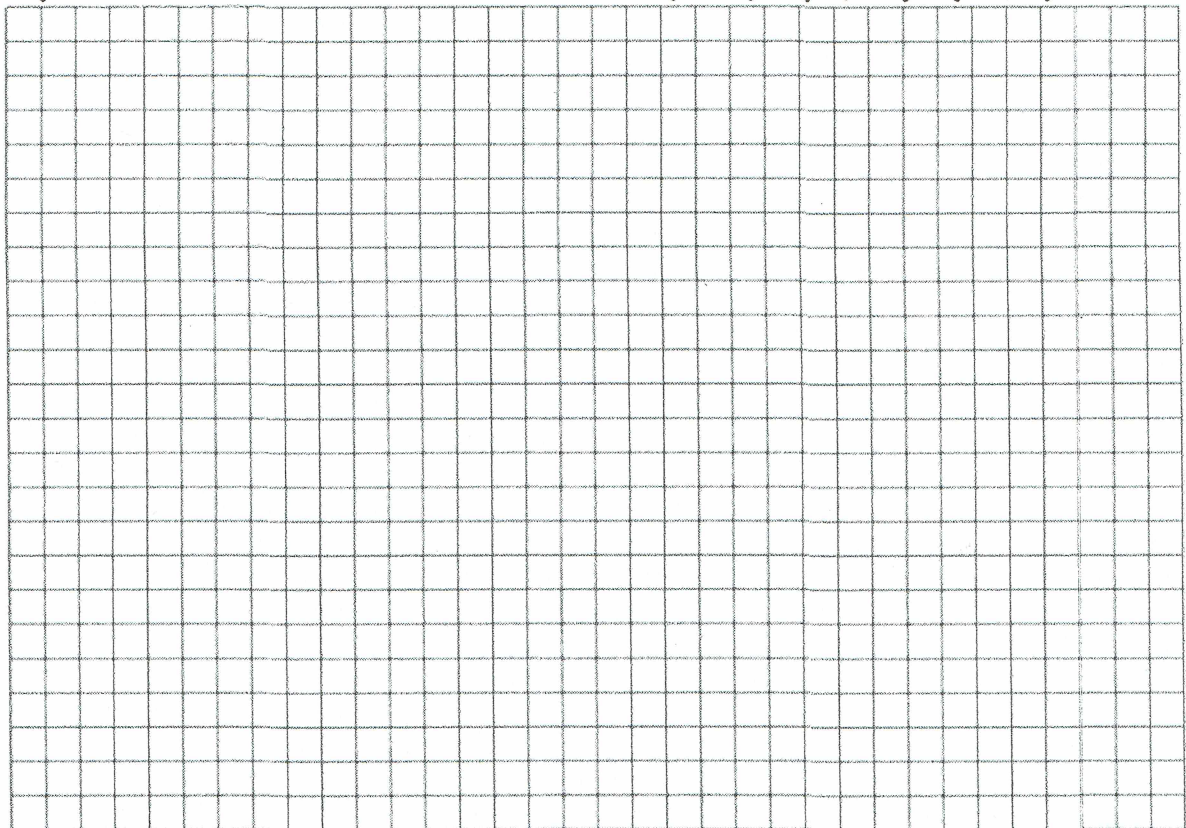
Q5: Find the area of the $\triangle MNO$ $M(5,-8)N(-2,-3)O(-2,4)$



Q6: Find the area of the $\triangle GHI$ $G(5,-1)H(-5,-2)I(-2,0)$



Q7: Find the area of the $\triangle JKL$ $J(4,4)K(3,-3)L(-1,9)$



Q8: Find the area of the $\triangle BEN$ $B(0,-2)E(-5,3)N(-2,-9)$

