

# EQUITY

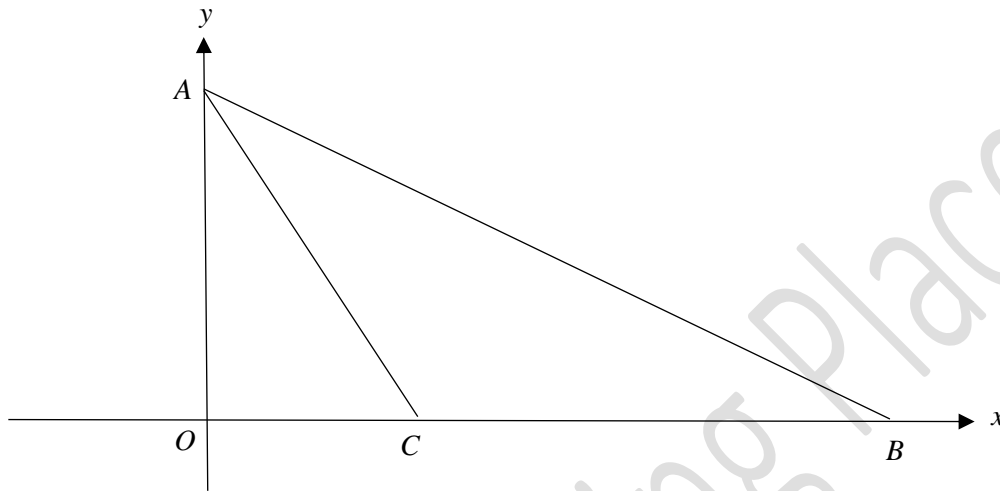
## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

---

#### Question 1:

The diagram shows a sketch of a straight line  $AB$  with equation  $5y + 2x = 35$ . The length of  $BC$  is 10 units.



- Show that the coordinates of A and B are  $(0,7)$  and  $(17.5,0)$  respectively.
- Find the length of  $AB$ .
- Find the equation of the line  $AC$ .
- Find the shortest distance from  $C$  to the line  $AB$ .
- The line  $y = 2x - 1$  intersects  $AB$  at  $D$ . Find the coordinates of  $D$ .

#### Question 2:

The point  $P$  is  $(0, k - 3)$  and it lies on the line,  $l$ , with gradient  $= -\frac{2}{5}$  and  $y$ -intercept  $= 2$ .

- Find the value of  $k$ .
- Given that  $Q(-2, n)$  lies on the line  $l$ , find the value of  $n$ .

# EQUITY

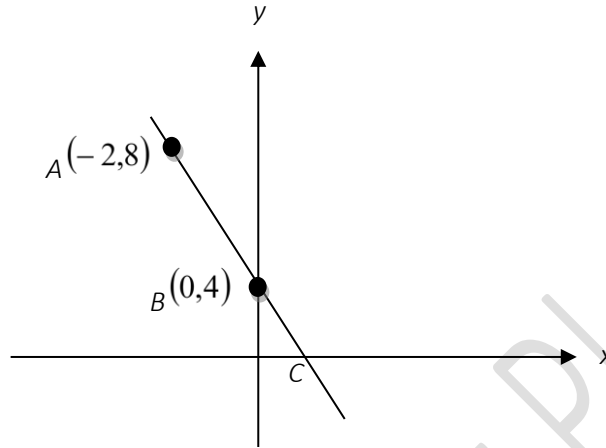
## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

---

#### Question 3:

The diagram shows a straight line passing through the points  $A(-2,8)$ ,  $B(0,4)$  and  $C$ .



- Calculate the length of the line joining  $A$  to  $B$ .
- Find the equation of the line.
- Write down the coordinates of point  $C$ .

#### Question 4:

The coordinates of points  $A$  and  $B$  are  $(-2,5)$  and  $(2.5,-4)$  respectively.

- Calculate the distance between the two points.
- If a line passes through the two points, find the equation of the line.

#### Question 5:

Line  $p$  passes through the points  $A(-1,-6)$  and  $B(3,4)$ .

- Find the length of  $AB$ .
- Find the gradient of the line  $p$ .
- Find the equation of line  $p$ .
- Verify if the point  $(-1, 27)$  lies on the line  $p$ .

# EQUITY

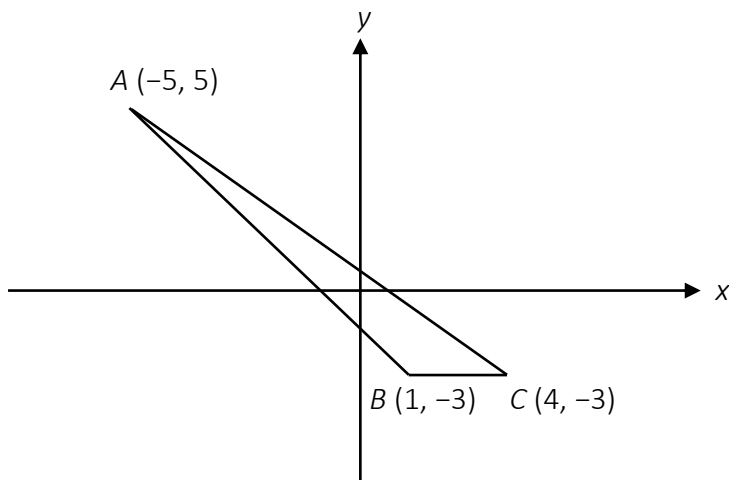
## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

---

#### Question 6:

In the diagram, points  $A(-5, 5)$ ,  $B(1, -3)$  and  $C(4, -3)$  form an obtuse triangle.



Find

- the length  $AB$ ,
- the coordinates of  $D$  such that  $ABCD$  is a parallelogram
- the equation of line  $AB$ ,
- the coordinates of  $M$  and of  $N$  given that  $AB$  cuts the  $x$ -axis and  $y$ -axis at  $M$  and  $N$  respectively,
- the area of triangle  $ABC$ ,
- the exact value of  $\cos ABC$ .

#### Question 7:

The line  $6x - 3y = 24$  cuts the  $x$ -axis at  $M$  and  $y$ -axis at  $N$ .

- Find the coordinates of  $M$  and  $N$ .
- Another line  $l$  has the same gradient as the given line and passes through the point  $(1, 5)$ . Find the equation of the line  $l$ .

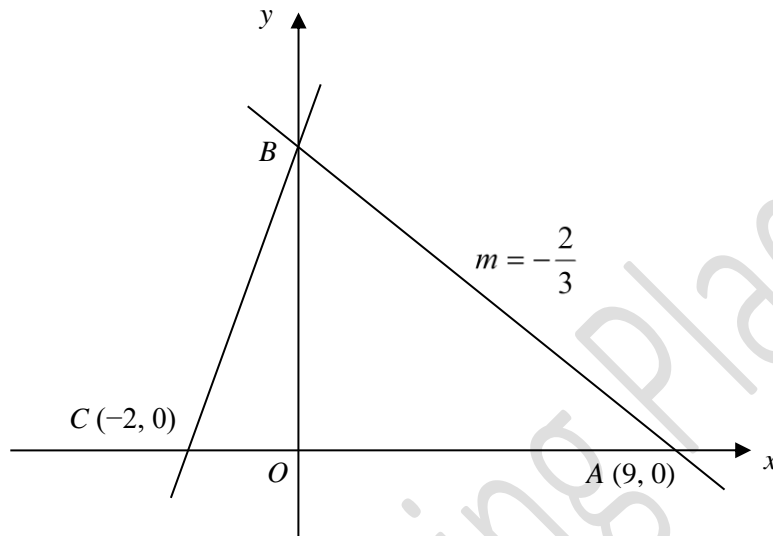
# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

#### Question 8:

In the diagram, which is not drawn to scale, the coordinates of  $A$  and  $C$  are  $(9, 0)$  and  $(-2, 0)$  respectively.



The gradient,  $m$ , of the line  $AB$  is  $-\frac{2}{3}$ .

- Find the equation of the line  $AB$ .
- Find the equation of the line  $BC$ .
- Determine whether triangle  $ABC$  is a right-angled triangle.
- Find the area of triangle  $ABC$ .

#### Question 9:

A straight line passes through the points  $A(0, 16)$  and  $B(8, 2)$ .

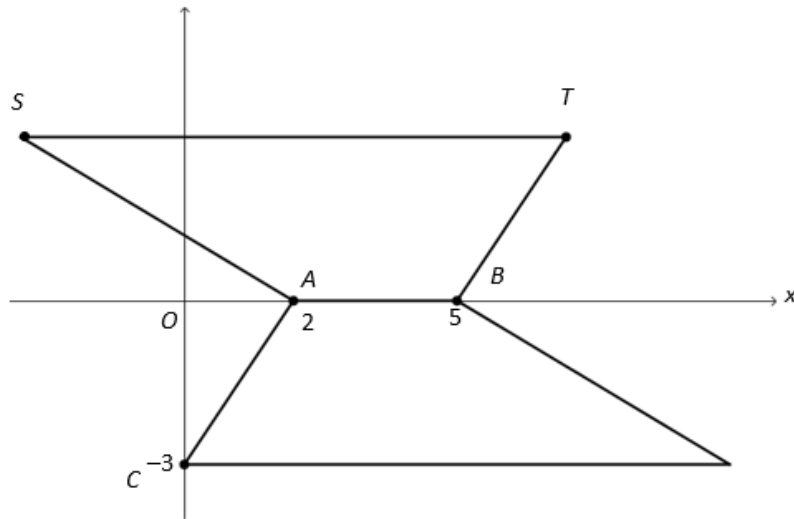
- Find the equation of line  $AB$ .
- Find the value of  $n$  given that  $(6, n)$  lies on the line  $AB$ .

# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

Question 10:



The diagram shows two congruent trapeziums on an  $xy$ -plane. The points  $A$  and  $B$  lie on the  $x$ -axis and the point  $C$  lies on the  $y$ -axis.

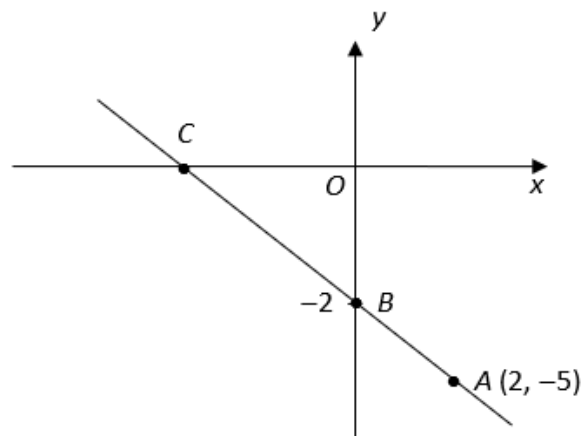
- Find the coordinates of the point  $T$ .
- Given that the combined area of both trapeziums is  $39 \text{ units}^2$ , find the coordinates of the point  $S$ .

Question 11:

The diagram shows a sketch of a straight line passing through the points  $A(2, -5)$ ,  $B$  on the  $y$ -axis and  $C$  on the  $x$ -axis.

Find the

- equation of the line,
- coordinates of  $C$
- equation of the line parallel to  $BC$  and passing through the origin



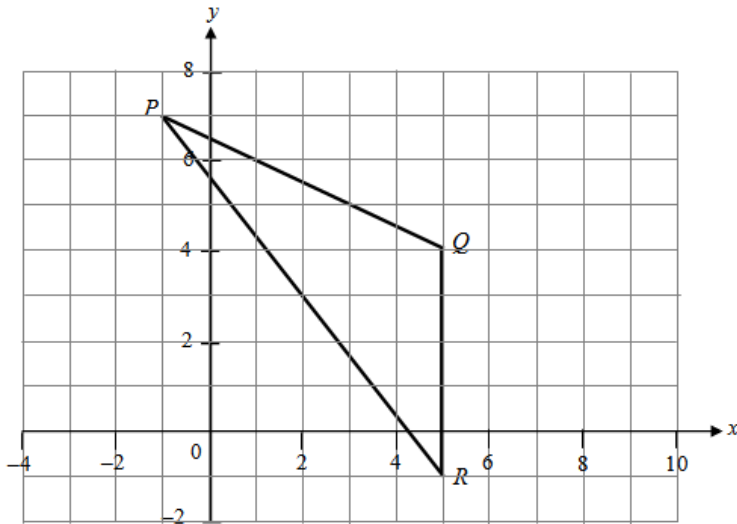
# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

#### Question 12:

The points  $P(-1, 7)$ ,  $Q(5, 4)$  and  $R(5, -1)$  are shown in the diagram



Find

- the gradient of line  $PQ$ ,
- the equation of the line  $PQ$ ,
- the length of line  $PQ$ ,
- $\cos \angle PQR$ ,
- the area of triangle  $PQR$ .

#### Question 13:

The coordinates of  $O$ ,  $A$  and  $B$  are  $(0, 0)$ ,  $(5, 0)$  and  $(7, 8)$  respectively. Find

- the gradient of  $AB$ ,
- the equation of  $AB$
- the area of triangle  $OAB$
- The distance between the points  $(2-k, 1)$  and  $(2, k)$  is  $\sqrt{5-4k}$  units.  
Find the possible values of  $k$ .

# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

---

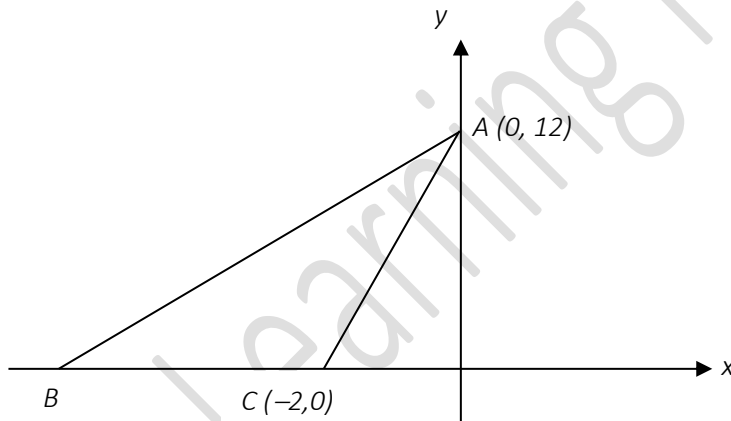
#### Question 14:

The line  $3y - 6x + 9 = 0$  cuts the  $y$ -axis at  $P$  and the  $x$ -axis at  $Q$ .

- State the gradient of the line  $PQ$ .
- Find the coordinates of  $P$  and  $Q$ .
- Find the equation of another line,  $l$ , which is parallel to the line  $PQ$  and passes through the point  $(1, -8)$ .

#### Question 15:

In the figure below,  $B$  lies on the  $x$ -axis. The area of  $\triangle ABC$  is  $48 \text{ units}^2$  and the equation of the line  $AB$  is  $y = ax + b$ .



- Find the coordinates of the point  $B$ ,
- Find the value of  $a$  and of  $b$ .
- Show that the points  $B$ ,  $D$  and  $A$  are collinear, where  $D$  is  $(-5, 6)$ .

# EQUITY

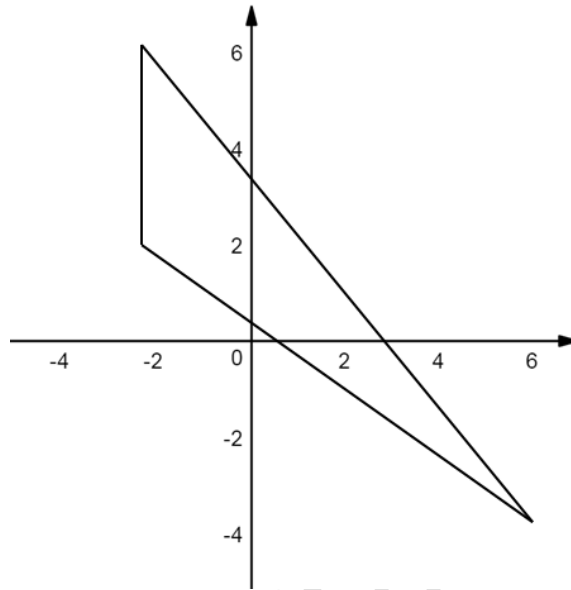
## LEARNING PLACE

### Elementary Math Topical (**Coordinate Geometry**)

---

#### Question 16:

The diagram below shows three labelled points  $A(-2,6)$ ,  $B(-2,2)$  and  $C(6,-4)$ .  $D$  is a point where the line  $AC$  meets the  $x$ -axis.



Find

- the gradient of the line  $AC$  and hence the equation of  $AC$
- the coordinates of  $D$  and **hence** the acute angle which the line  $AD$  makes with the  $x$ -axis,
- the **exact** value of  $\cos \angle ABC$
- the area of triangle  $ABC$

#### Question 17:

The line  $4x + 2y = 14$  crosses the  $x$ -axis at the point  $A$ .

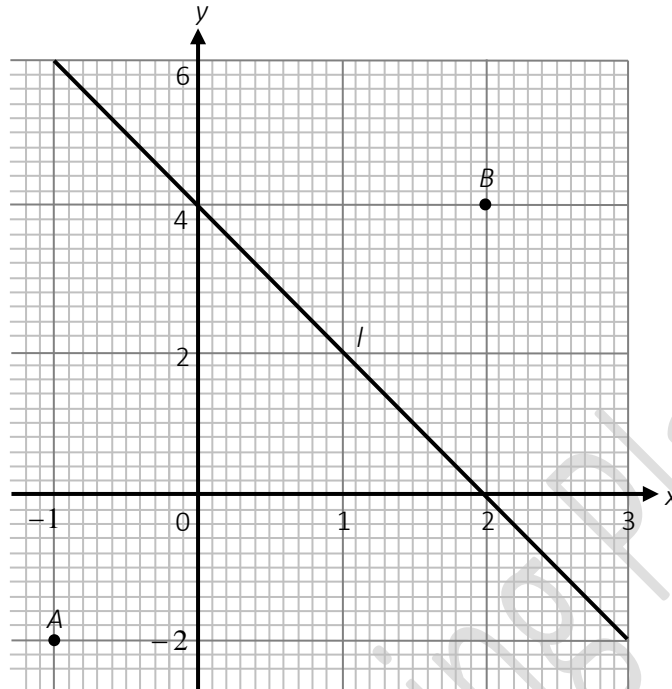
- Find the gradient of the line.
- Find the coordinates of point  $A$ .

#### Question 18:

# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

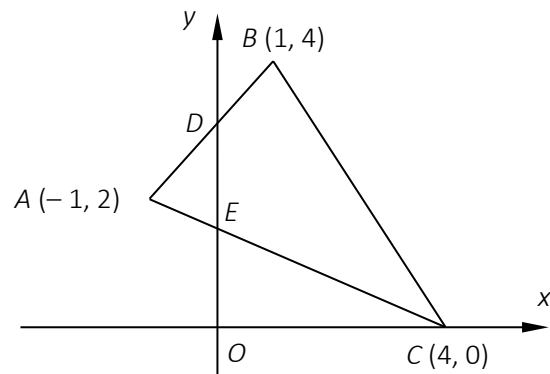


- a) Calculate the length of  $AB$ .
- b) Calculate the gradient of the line  $l$ .
- c) Find the equation of line  $l$ .

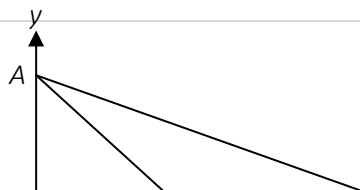
Question 19:

In the diagram,  $O$  is the origin,  $A$  is  $(-1, 2)$ ,  $B$  is  $(1, 4)$ ,  $C$  is  $(4, 0)$ .  $D$  and  $E$  are points of intersections where  $AB$  and  $AC$  cut the  $y$ -axis.

- a) Find the length of  $BC$ .
- b) Determine the equation of line  $AC$ .
- c) State the value of  $\tan \angle ACO$  as a fraction.
- d) Calculate the value of  $\frac{\text{area of triangle } ADE}{\text{area of triangle } ABC}$ .



Question 20:



# EQUITY

## LEARNING PLACE

### Elementary Math Topical (Coordinate Geometry)

---

In the diagram, the equation of the line  $AB$  is  $3y + x = 18$  and the length of  $BC$  is 12 units. Write down

- a) the coordinates of  $A$
- b) the coordinates of  $B$
- c) Find the length of  $AB$ .

$Q$  is a point on the line  $AB$  with  $y$ -coordinate  $k$ . It is given that the gradient of the line  $CQ$  is  $\frac{4}{5}$ .

- d) Find the value of  $k$ .
- e) **Hence**, calculate the area of triangle  $CQB$ .