

Mathematics

# Ratio and proportion in geometry

## Lesson 2 of 4

### Downloadable Resource

Miss Kidd-Rossiter



# Try this

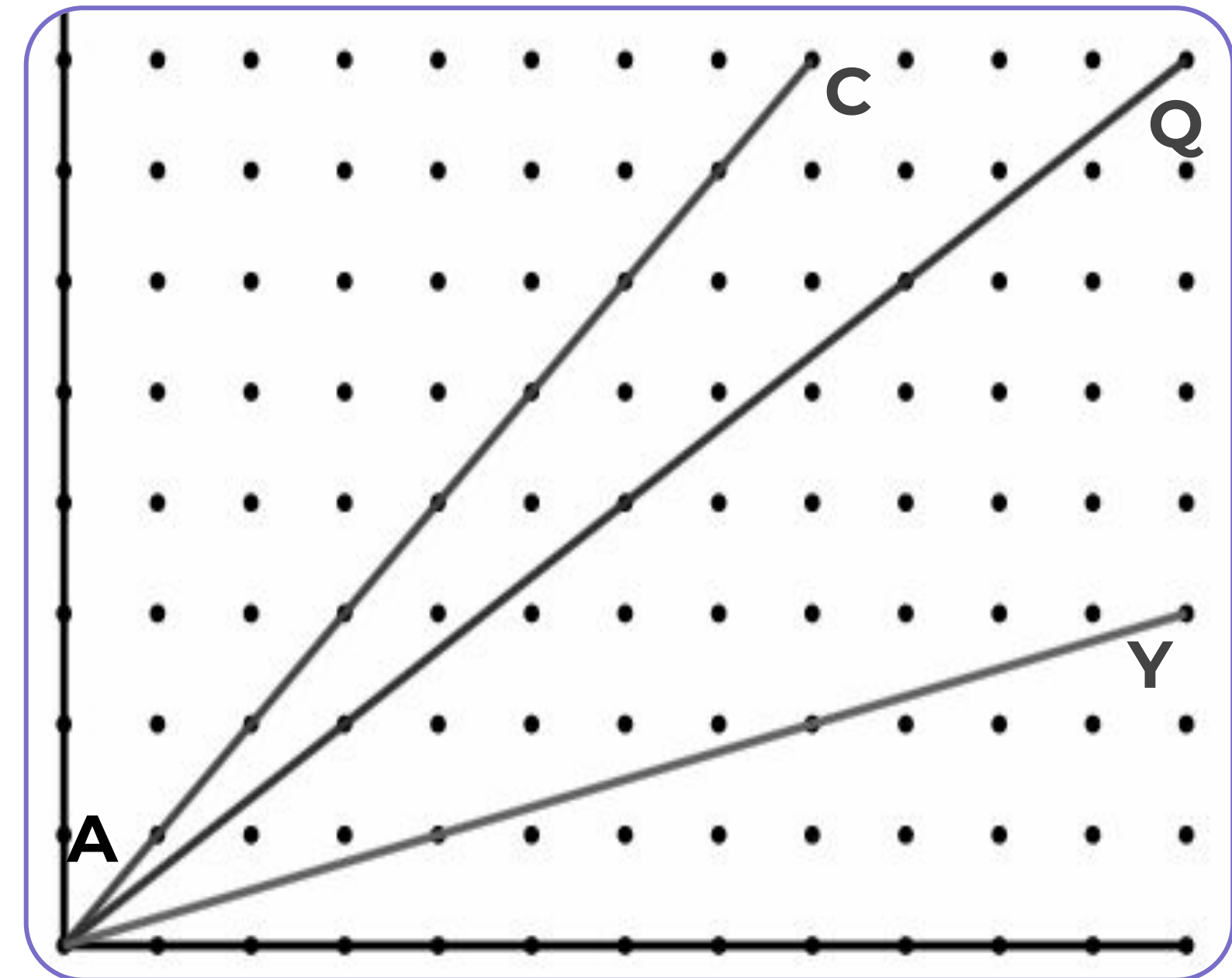
Choose a point on one of the lines  $AC$ ,  $AQ$  or  $AY$ .

For example, choose a point  $H$  on  $AC$ .

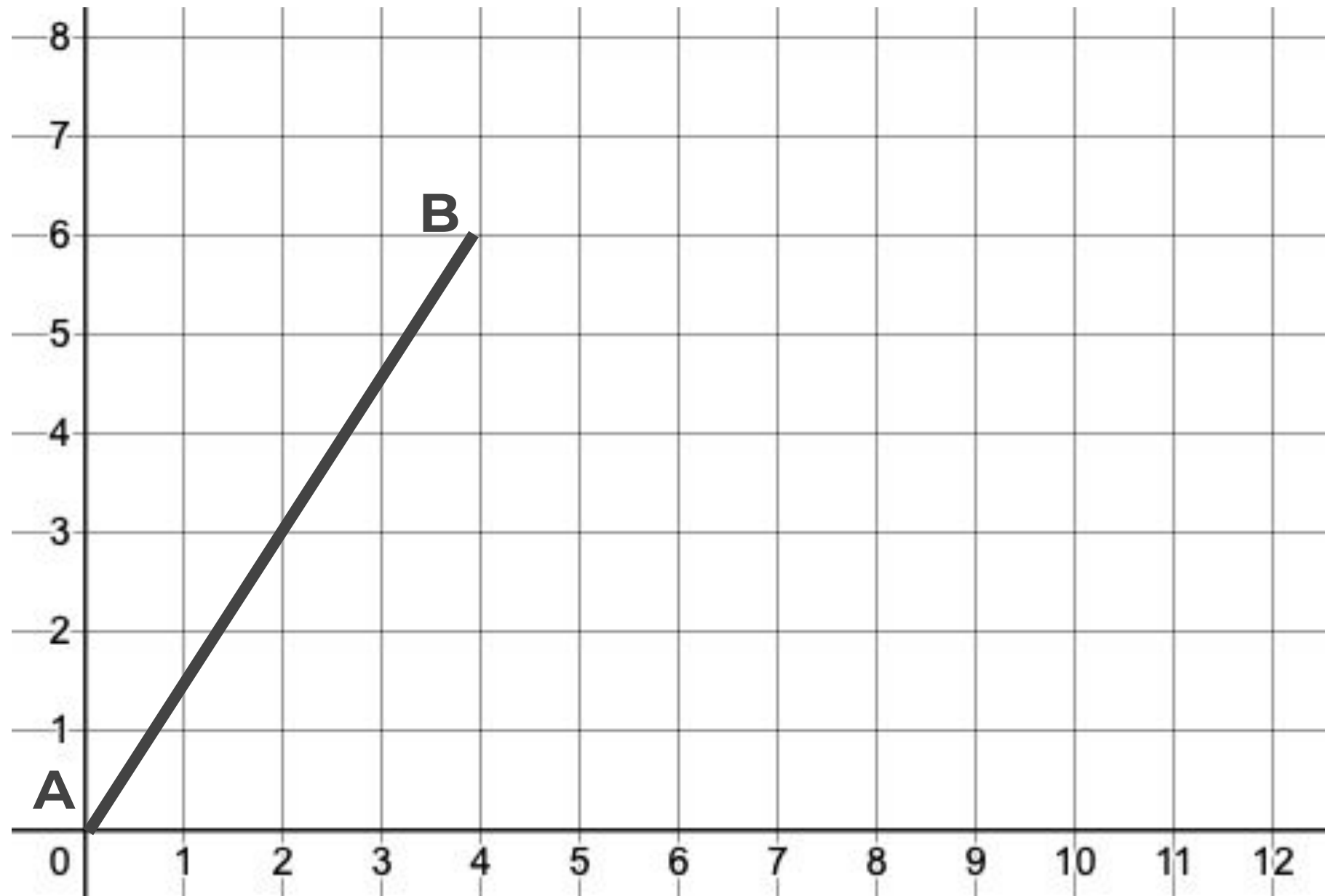
Work out the ratios  $AH : AC$  and  $AH : HC$ , and also the fractions  $\frac{AH}{AC}$  and  $\frac{AH}{HC}$ .

What's the same and what's different?

Choose a new point and continue to investigate.



# Connect



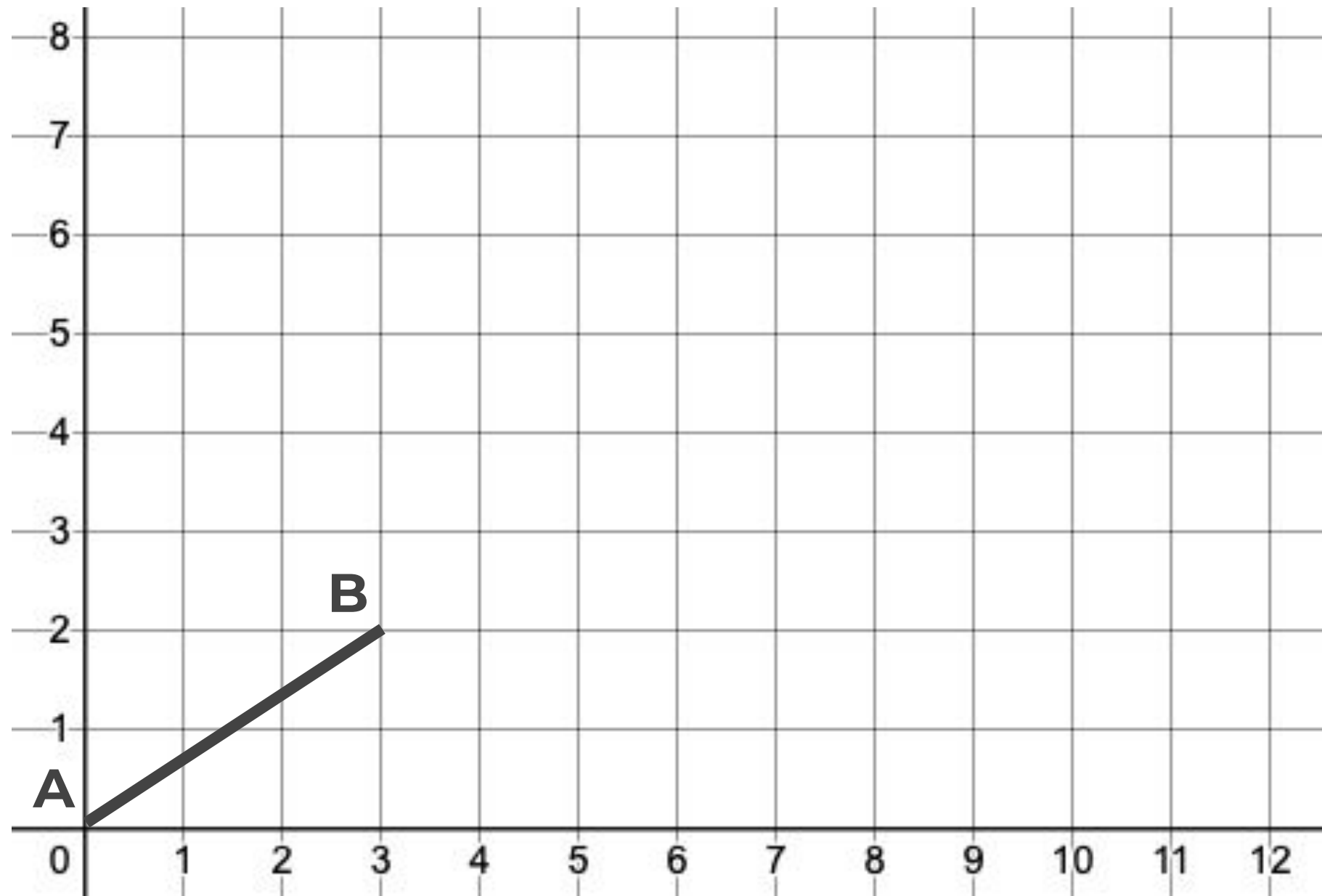
What is the midpoint of line segment AB?

What is the ratio of AM : AB?

What is the ratio of AM : MB?



# Connect

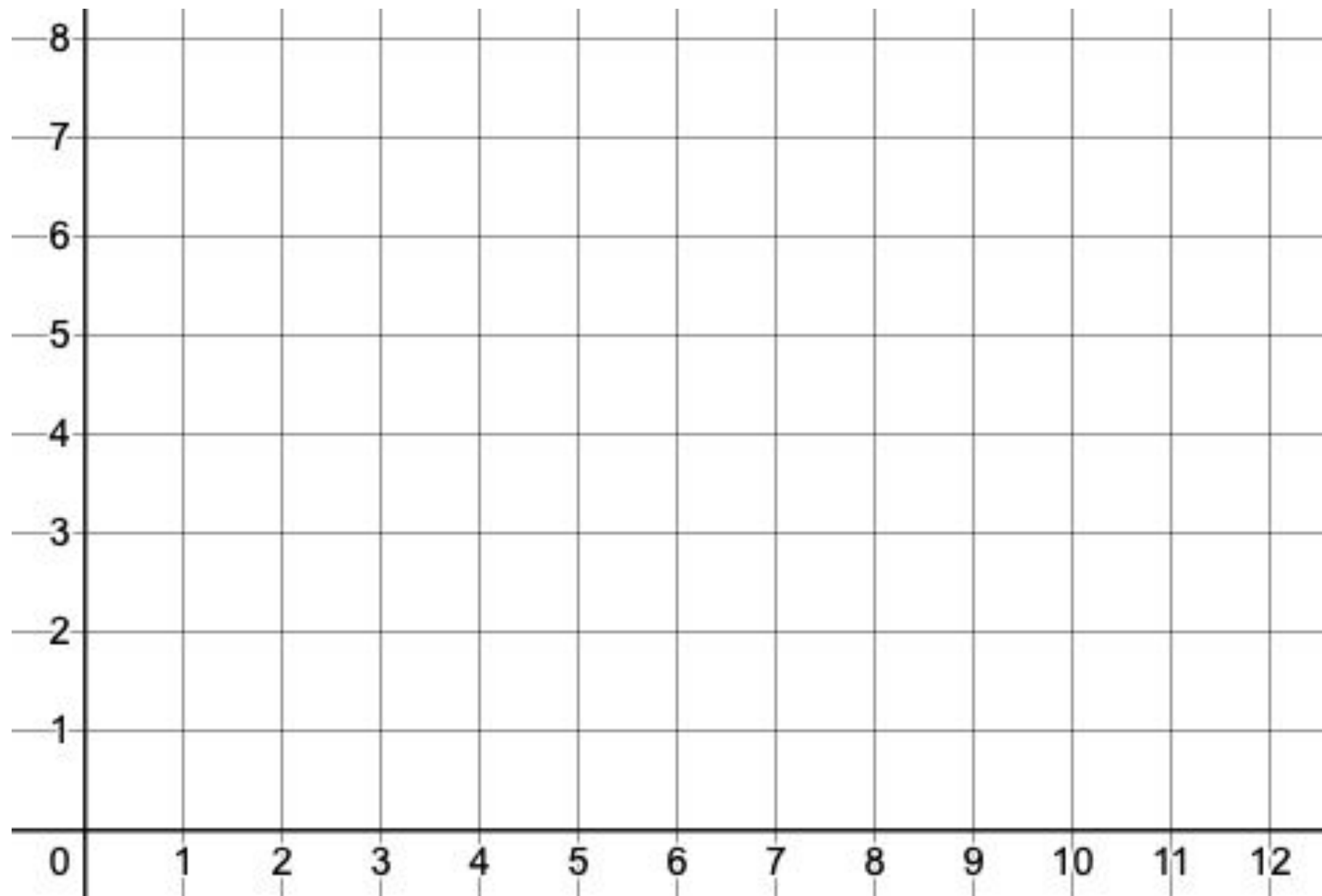


How can I extend the line so that the ratio  $AB : AD$  is  $1 : 4$ ?

Plot point C on the line so that the length CD is  $\frac{1}{3}$  of the length of AC.



# Independent task

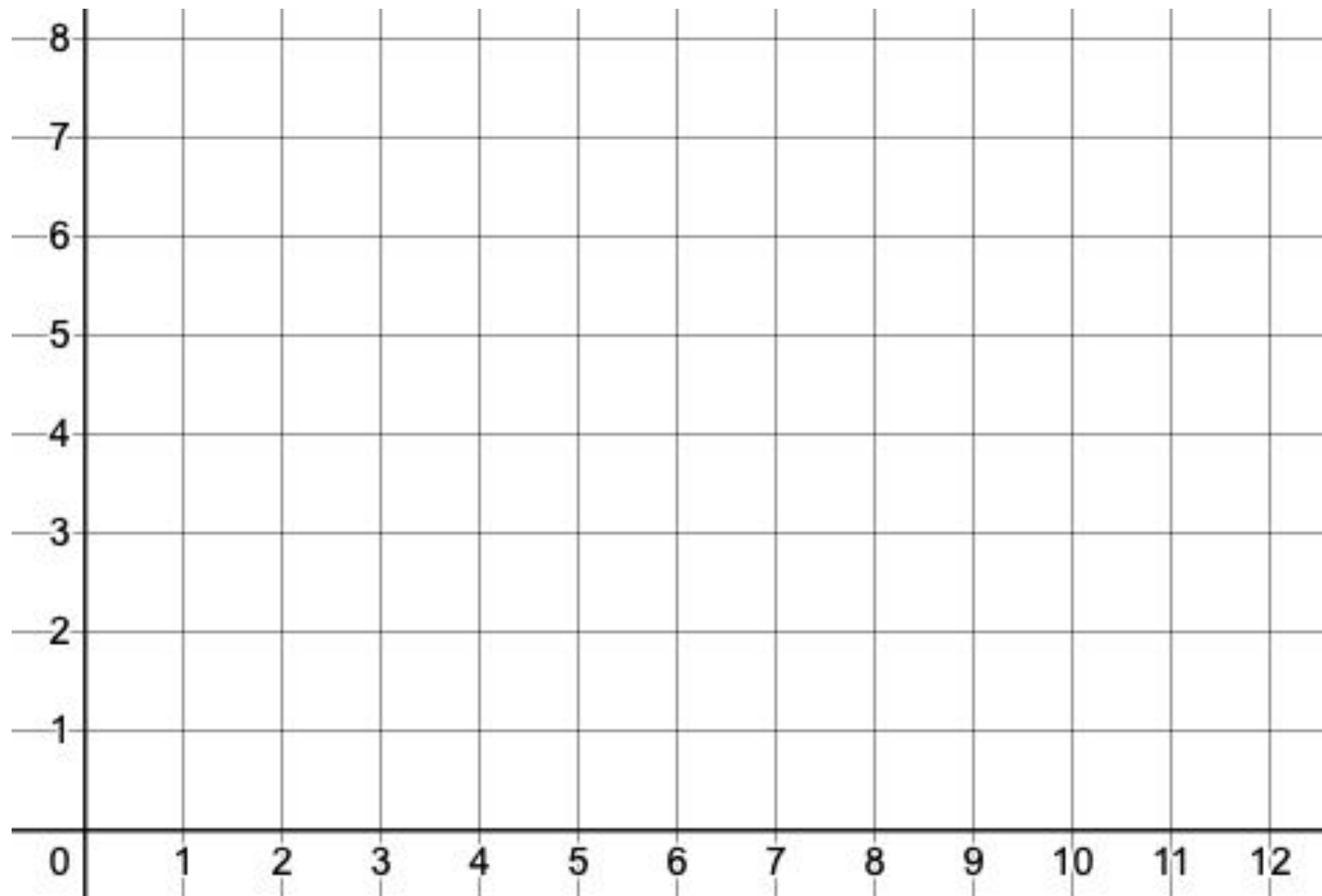


The line  $AMB$  is drawn on the axes to the left, where  $M$  is the midpoint.  $B$  has coordinate  $(10, 8)$ . What is the coordinate of  $A$  if:

- a.  $M$  is  $(5, 4)$ ?
- b.  $M$  is  $(7, 5)$ ?
- c.  $M$  is  $(10, 5.5)$ ?
- d.  $M$  is  $(10.5, 6.25)$ ?



# Independent task



The line  $AQB$  is drawn on the axes to the left, where  $Q$  is a point on the line.  $B$  has coordinate  $(10, 8)$ . What are the coordinates of:

- a.  $Q$  if  $A$  is  $(1, 2)$  and  $AQ:QB$  is  $1:2$ ?
- b.  $Q$  if  $A$  is  $(1, 2)$  and  $AQ:AB$  is  $2:3$ ?
- c.  $A$  if  $Q$  is  $(4, 5)$  and  $AQ:AB$  is  $2:5$ ?
- d.  $A$  if  $Q$  is  $(11, 6)$  and  $AQ:QB$  is  $1:1$ ?



# Explore

Choose any three coordinates with integer values that form a straight line.

Write all the ratios you can associated with this line segment.

Can you find three integer coordinates for which these ratios might describe the relationship between points?

a)  $1:1$ ?

b)  $1:3$ ?

c)  $2:3$ ?

d)  $2:n$ ?

What about if my coordinates no longer have to be integers?

