

Mathematics

Ratio and proportion in geometry

Lesson 2 of 4

Downloadable Resource

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Try this

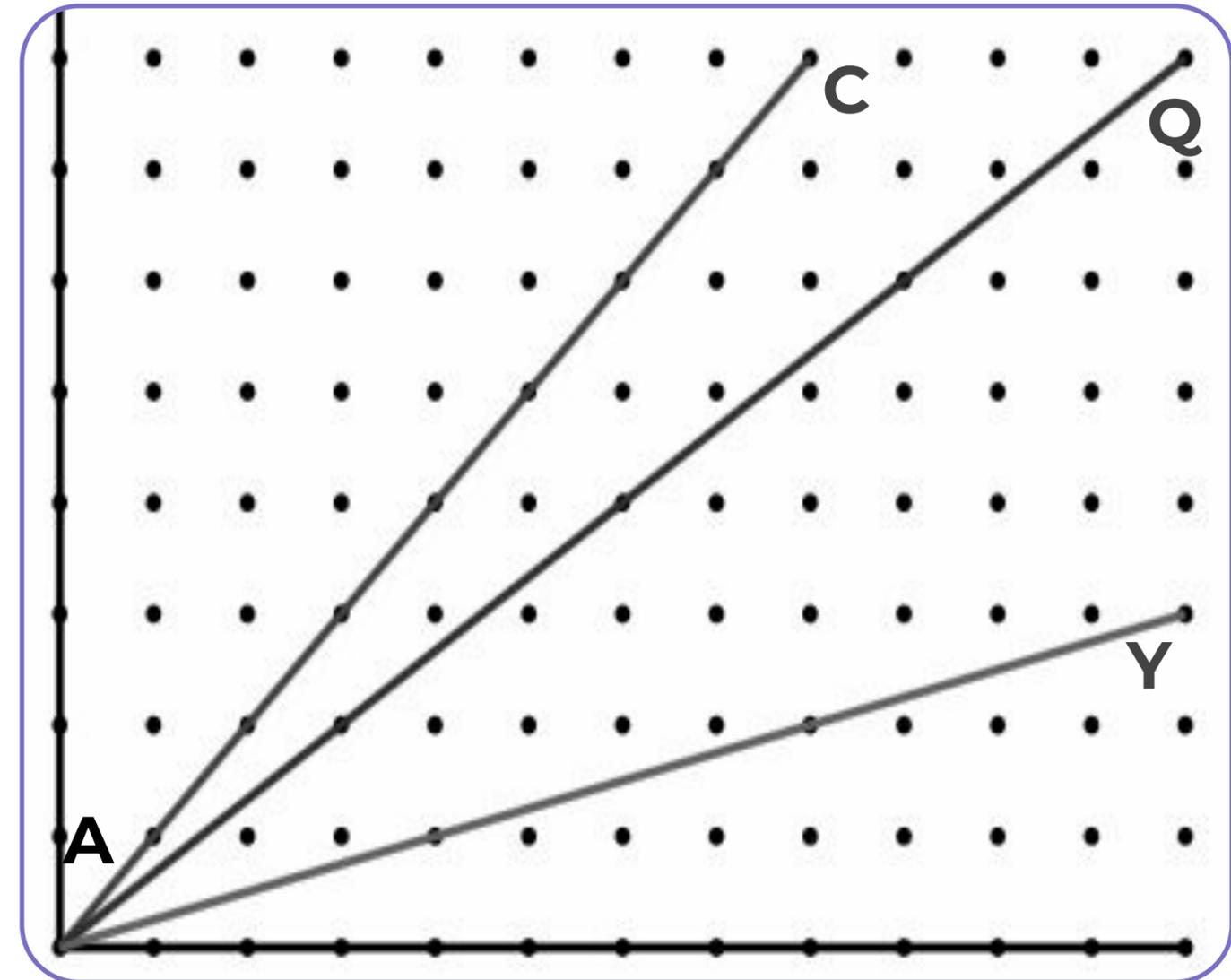
Choose a point on one of the lines AC , AQ or AY .

For example, choose a point H on AC .

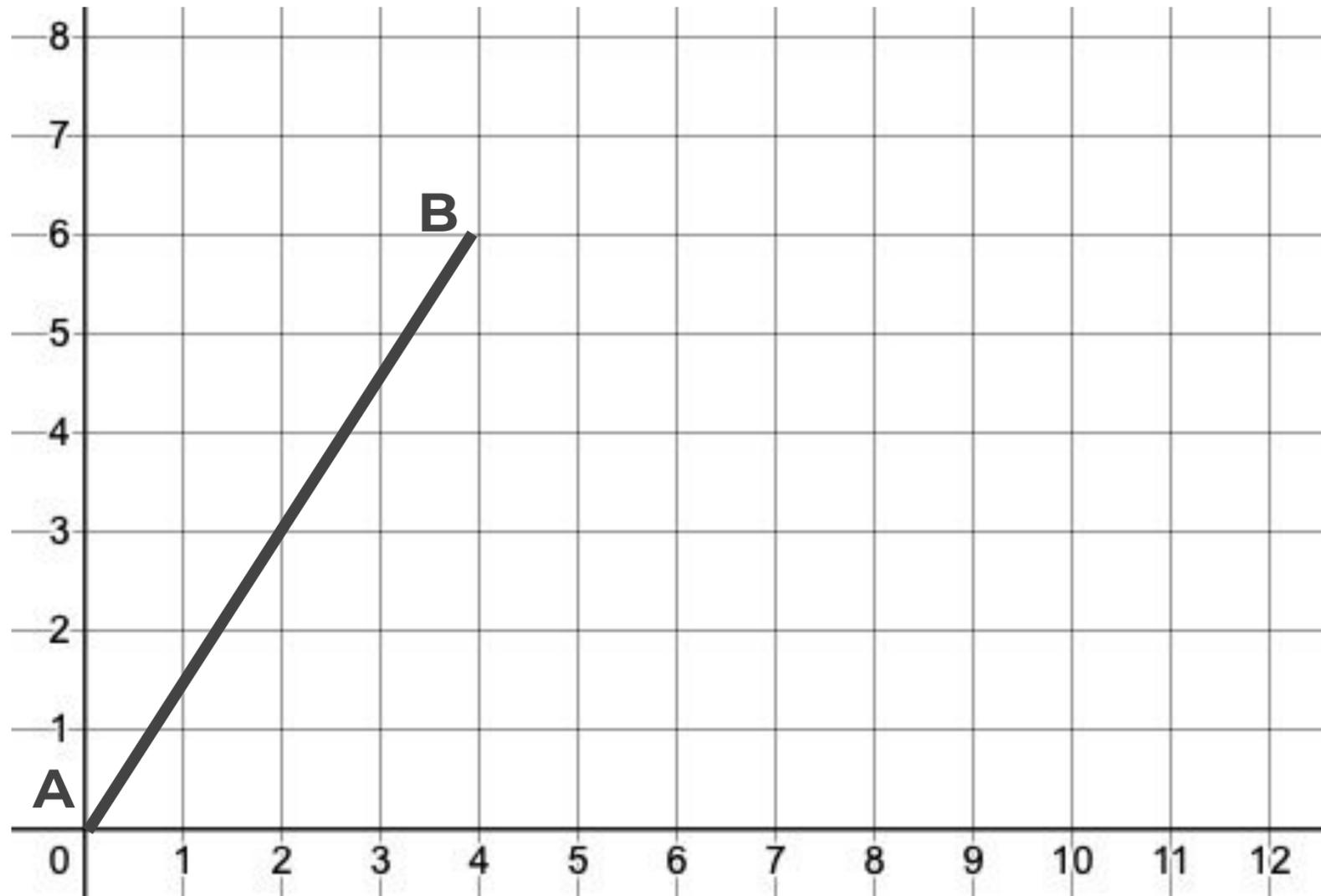
Work out the ratios $AH : AC$ and $AH : HC$, and also the fractions $\frac{AH}{AC}$ and $\frac{AH}{HC}$.

What's the same and what's different?

Choose a new point and continue to investigate.



Connect



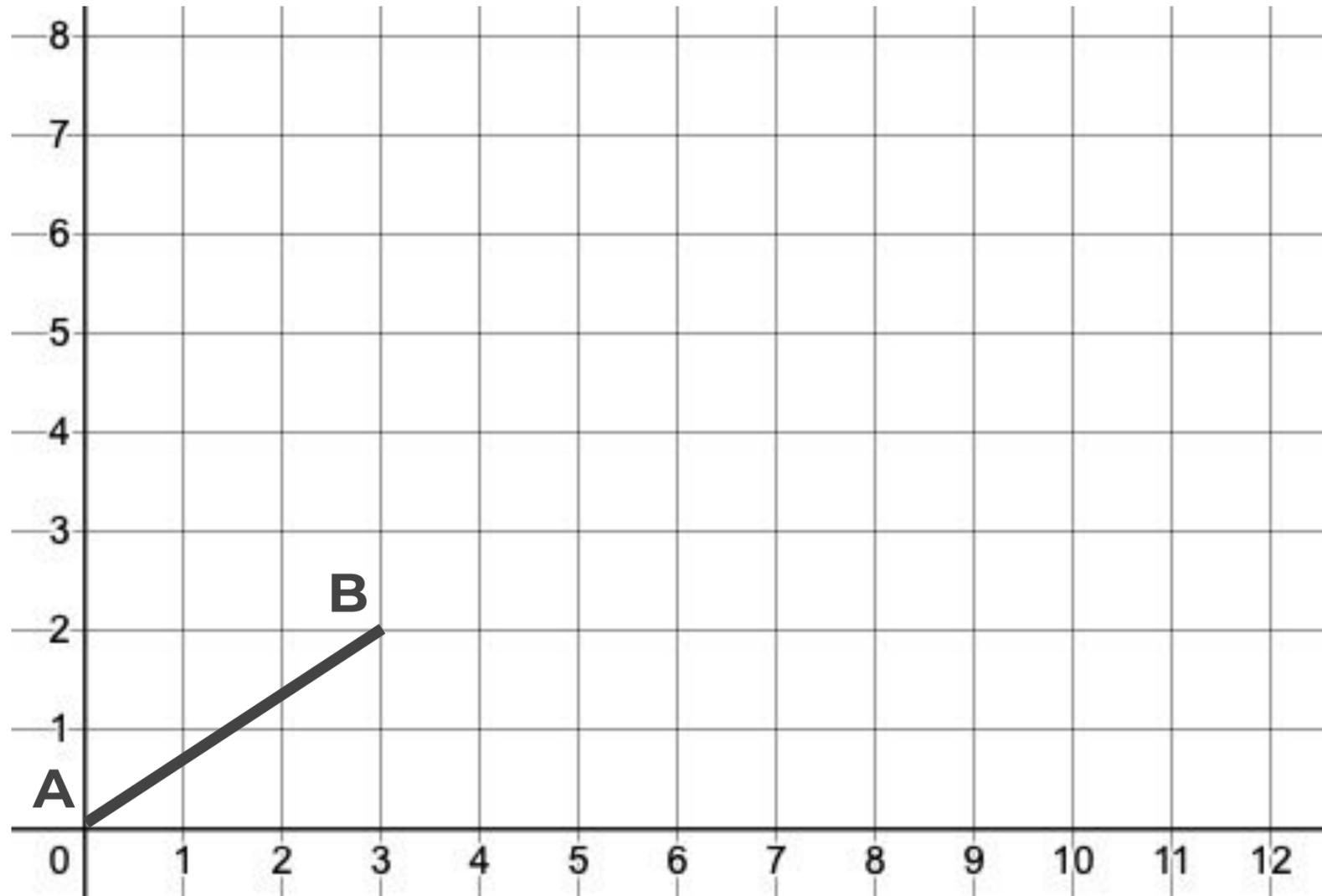
What is the midpoint of line segment AB?

What is the ratio of AM : AB?

What is the ratio of AM : MB?



Connect

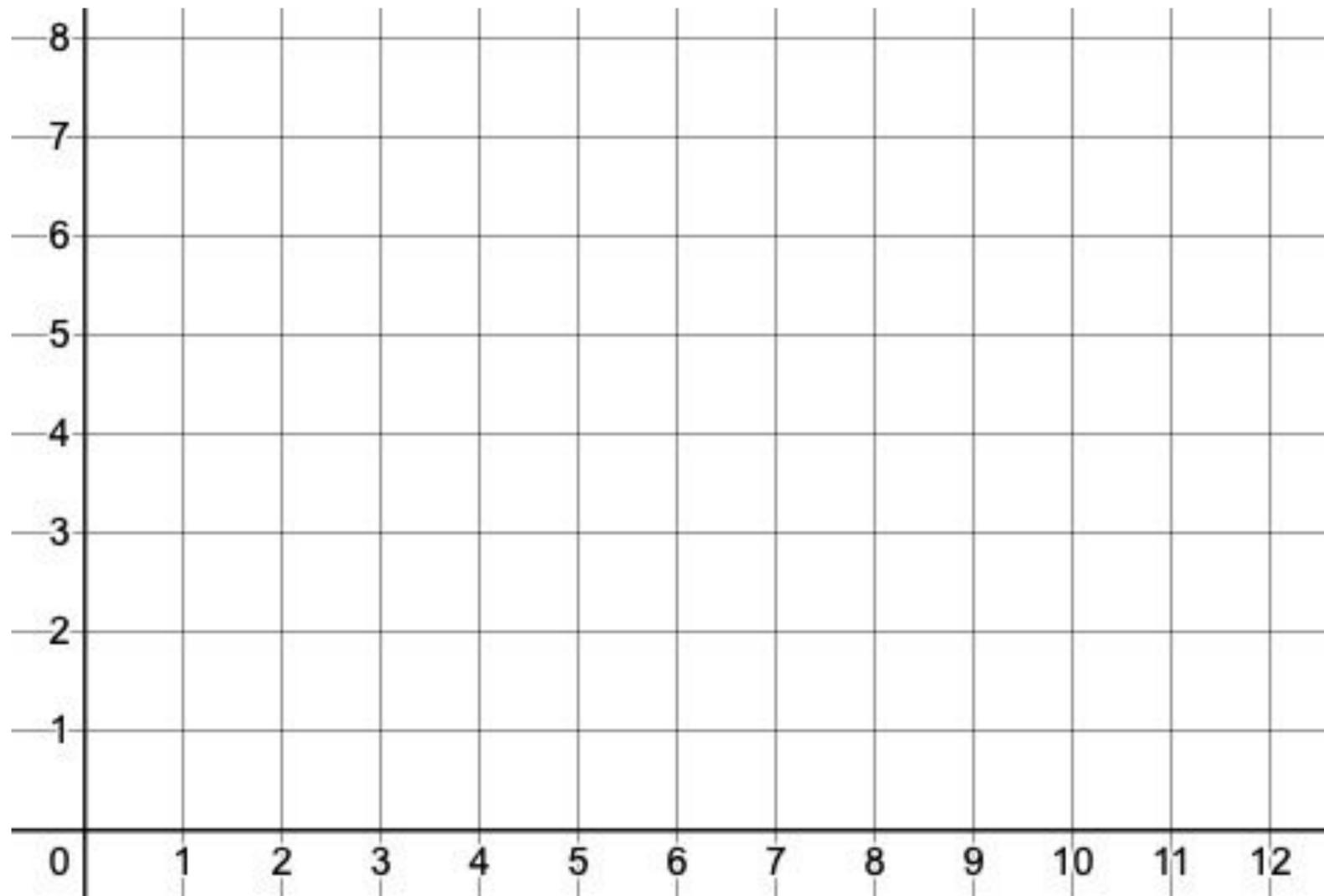


How can I extend the line so that the ratio $AB : AD$ is $1 : 4$?

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



Independent task

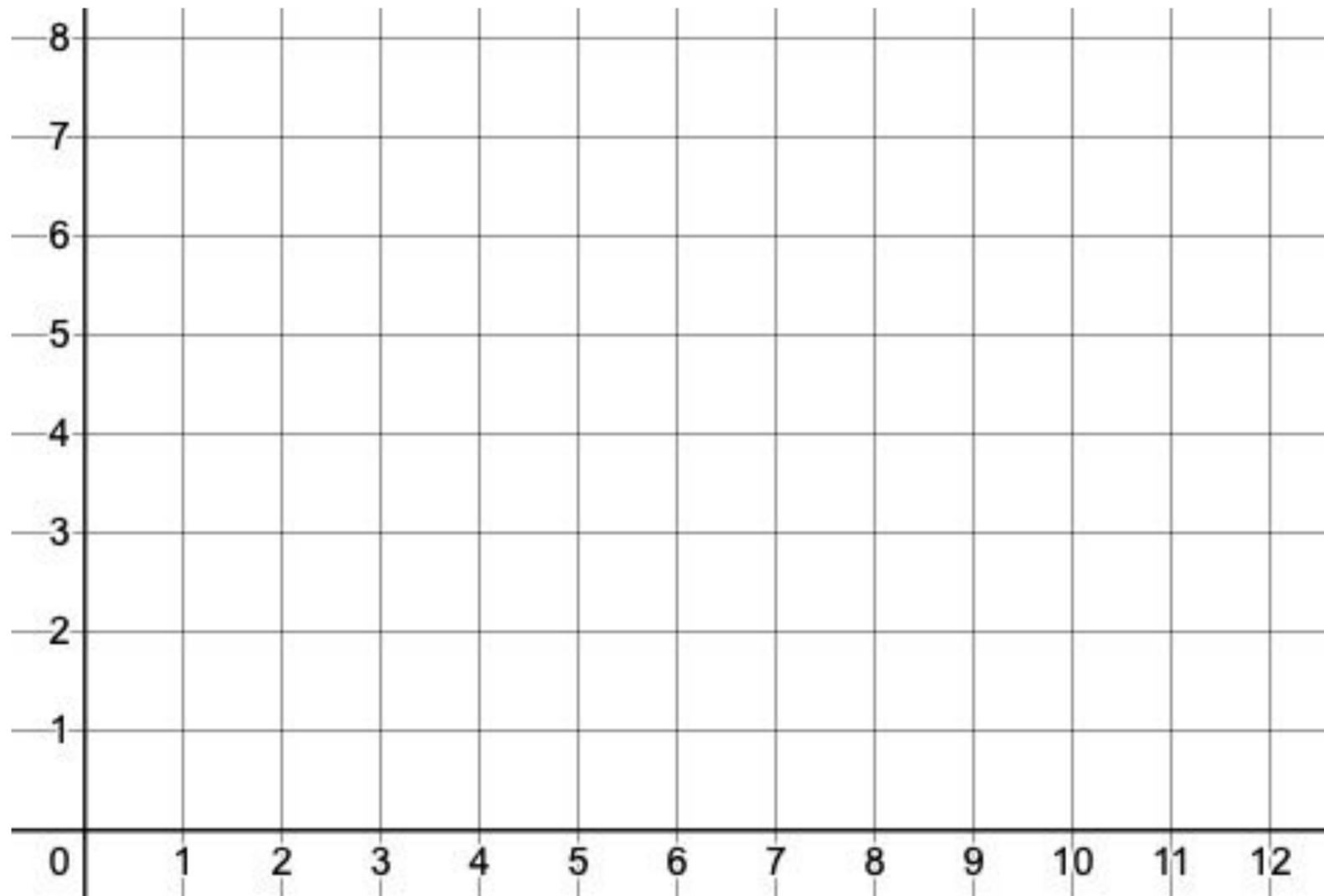


The line AMB is drawn on the axes to the left, where M is the midpoint. B has coordinate $(10, 8)$. What is the coordinate of A if:

- 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?

