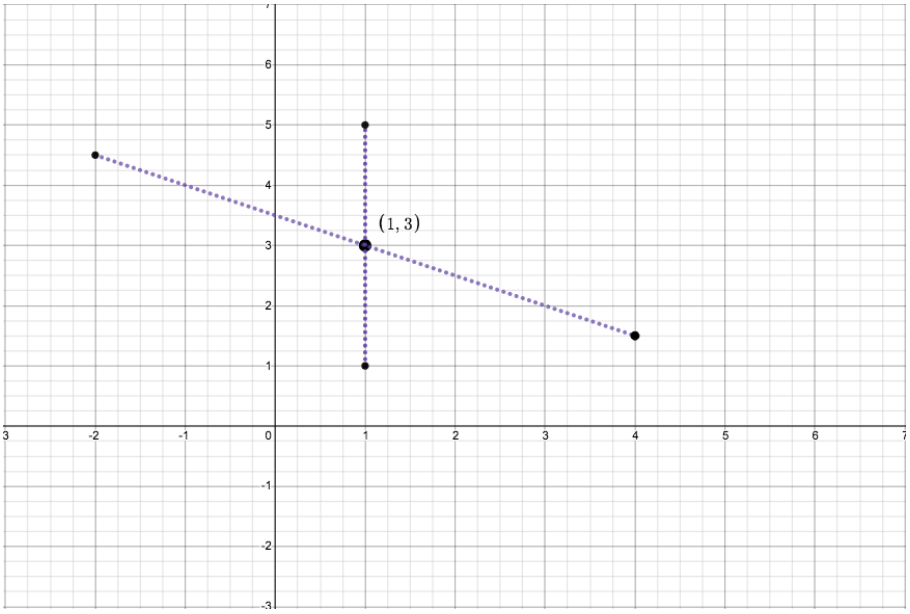
What's in a Line (Midpoint)

Main Task 1.

Given the point (1,3) is the midpoint of A B, find what A and B could be?

Find a total of 5 pairs of points where (1,3) is the midpoint.

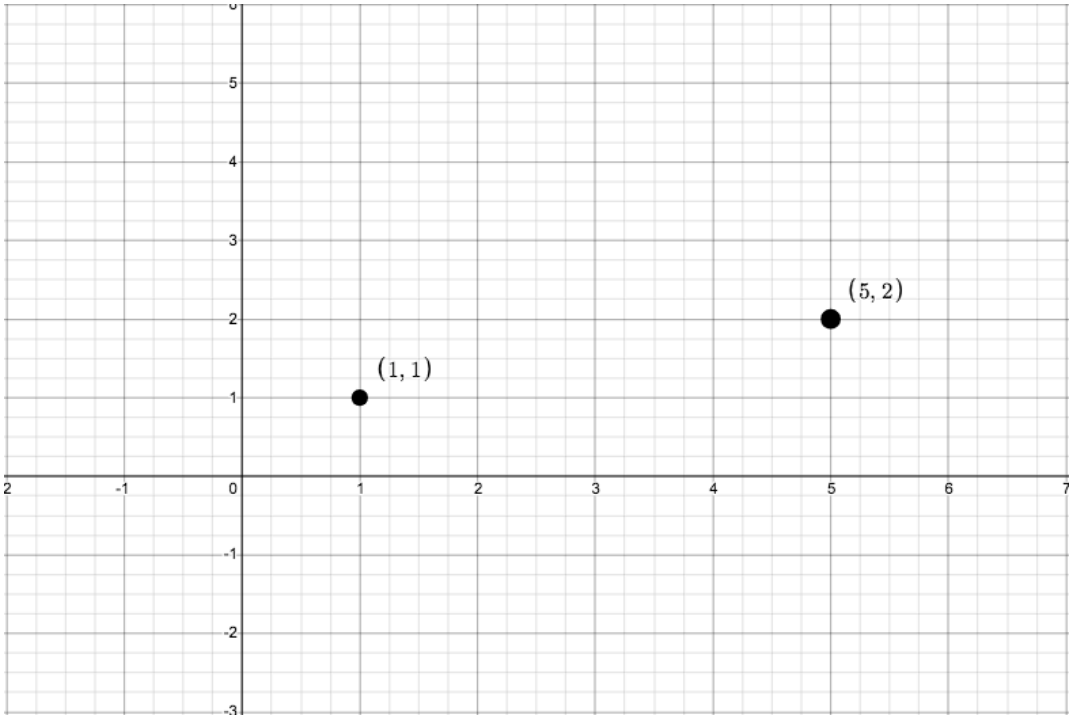
Note : The midpoint is the point that is in the middle of A and B
I've almost given you the first two. What are the coordinates of these points?



What patterns do you see?

Main Task 2.

Below you can see the two points which are plotted are A(1,1) and B(5,2)



a) What are the coordinates of the point which is right in the middle of A and B? (The midpoint)

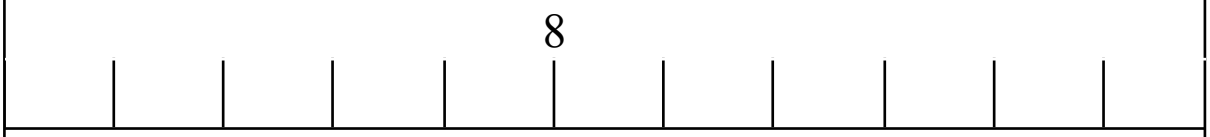
b) The point B(5,2) is right in the middle of A(1,1) and another point. What are the coordinates of the other point?

c) The point A(1,1) is right in the middle of B(5,2) and another point. What are the coordinates of the other point?

d) Can you figure out how we might find the midpoint of (10, 8) and (20, 12)? Explain how you found the midpoint.

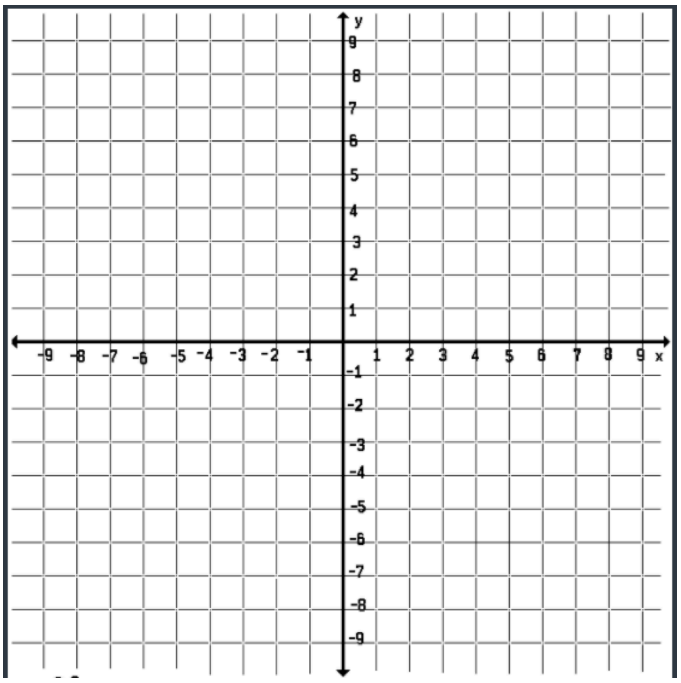
Enabling Prompts

1. What two numbers, is the number 8, right in the middle of?
   Give three different solutions



2. If -1 is in the middle of two numbers, what could the two numbers be?
   Give three different solutions

3. If the point (0,0) is the midpoint of two points, what could the two points be?



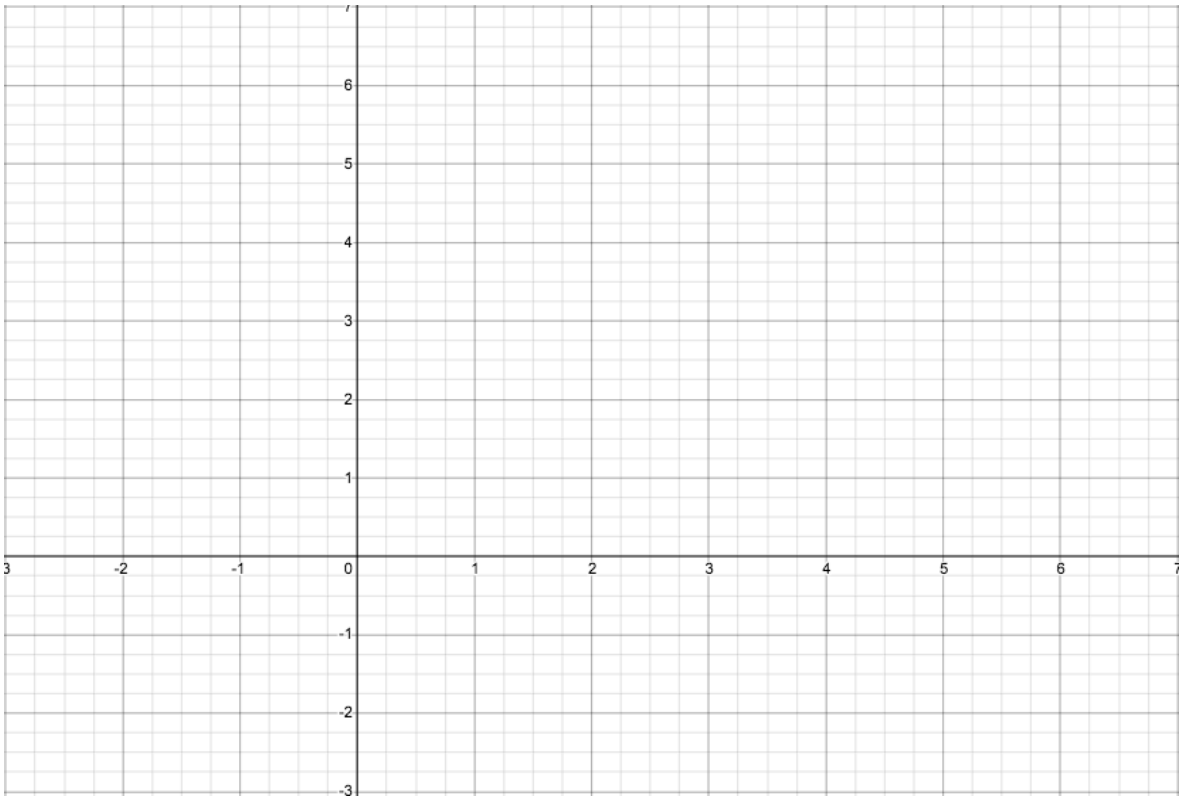
Extending Task

Given the point M = (1,4) is the midpoint of the interval AB, and AB has a gradient of -2, find three different pairs of points AB

Given that the point A = (-1,3) is the end point of an interval AB which has a midpoint of M. Find three different pairs of points for B and M.

Consolidating Task

Using the number plane below (or otherwise) complete these statements



1. The midpoint of (3 , 5) and (4 , 1) is (.... , ….)
2. The midpoint of (1 , 2) and (3 , 6) is (.... , ….)
3. The midpoint of (-1 , 5) and (5 , 4) is (.... , ….)
4. The midpoint of (.... , ….) and (3 , 4) is (5 , 2)
5. The midpoint of (.... , ….) and (-1 , -2) is (1 , 2)
6. The midpoint of (.... , ….) and (1 , -3) is (-2 , 1)
7. What are the coordinates of the midpoint of (12 , 6) and (20 , 7)
8. Explain how you know the midpoint of (6 , 10) and (2 , 52) is (4 , 31)