ANGLES AND LINES
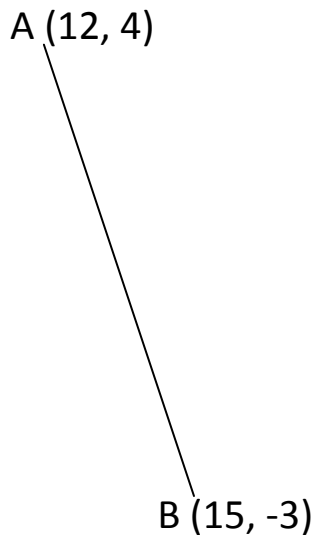
Finding the Midpoint and Endpoints of line

BIGGEST TIP: Draw a neat diagram.

Worked Example
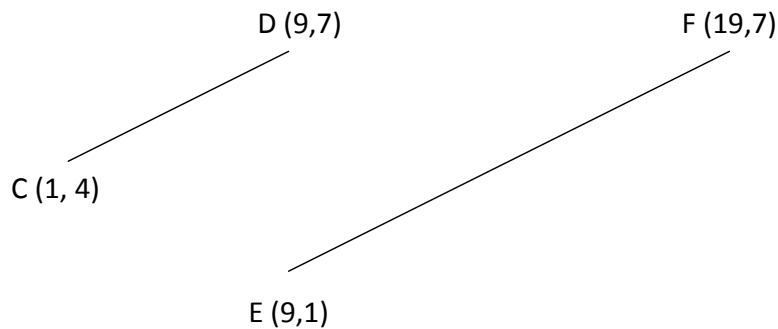
Finding the midpoint of a line:

A (12, 4)

To find the midpoint of line AB:

$$X: \frac{x_1 + x_2}{2} = \frac{12 + 15}{2} = \frac{27}{2} = 13\frac{1}{2}$$

$$y: \frac{y_1 + y_2}{2} = \frac{4 + (-3)}{2} = \frac{1}{2}$$

So the co-ordinates of the midpoint of line AB are $\left(13\frac{1}{2}, \frac{1}{2}\right)$.
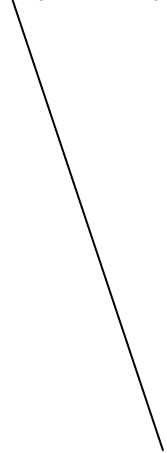
B (15, -3)

Below are two lines: CD and EF.

D (9,7)   F (19,7)

C (1, 4)

E (9,1)

a) Find the midpoint of line CD.
b) Find the midpoint of line EF.
c) The midpoints of CD and EF are labelled G (on line CD) and H (on line EF). Calculate the co-ordinates of the midpoint of GH.
d) Draw a diagram in your book to show the lines CD, EF, GH. Draw a line from F to D. Calculate the midpoint of DF.
e) Another line connects E to J. The midpoint of this line is at (14,2). What are the co-ordinates of point J?

2.   Look at the line KL. It runs from (17,18) to (26,-23).

K (17, 18)

a)   What is the midpoint of line KL?

b)   It turns out that KL is only a partially drawn line. L is actually the midpoint of a longer line called KM. What are the co-ordinates of M?

c)   Line NP runs from the midpoint of LM to (3,2). What is the midpoint of this new line (called QR)?

L (26, -23)

3.   Line AQ runs from point A (5, 7) to point Q (15,-23). A circle is drawn with the midpoint of AQ at the centre. What is the diameter of the circle?

4.   Line RS has an endpoint at (5,6) and a midpoint at (20,39).

a)   What is the length of the line?

b)   Line TU attaches itself to the midpoint of RS and (7,7). What is the midpoint of TU?

c)   If a line was drawn from R to U, what would be the midpoint of line RU?

5.   A square with horizontal and vertical sides has a midpoint at (6,6) and another midpoint on a different side at (-1, -1). What are the co-ordinates of the vertices of the square?