1. Solve $3x + 5 + 2x - 4 = 36$.

2. Find three cities on this map that appear to be collinear.

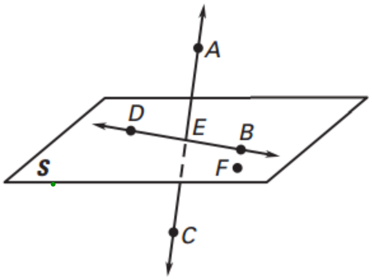
Use this figure for Exercises 1–4.

1. Give two other names for $\overleftrightarrow{AE}$.

2. Give another name for plane S.

3. Name three collinear points.

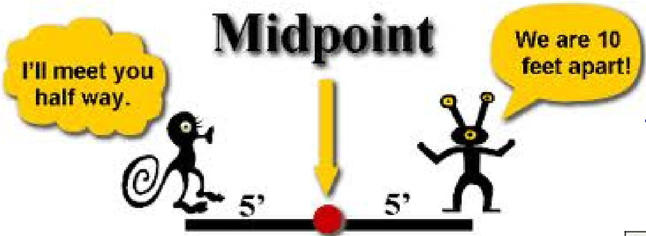
4. Name the intersection of $\overleftrightarrow{AC}$ and plane S.



Aug 27-7:30 AM

1-3 Use Midpoint and Distance Formulas

Goals: Find lengths of segments in the coordinate plane.



$$= \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

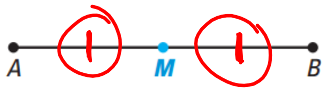
$$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

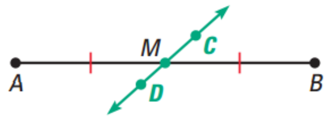
Aug 8-3:51 PM

Midpoint - a point that divides a segment into 2 congruent segments

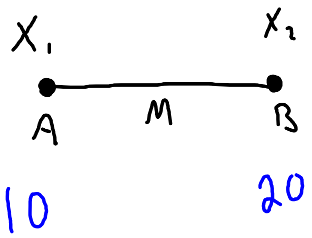
Segment Bisector - a point, ray, line, line segment, or plane that intersects the segment at its midpoint



M is the midpoint of $\overline{AB}$.
So, $\overline{AM} \cong \overline{MB}$ and $AM = MB$.



$\overleftrightarrow{CD}$ is a segment bisector of $\overline{AB}$.
So, $\overline{AM} \cong \overline{MB}$ and $AM = MB$.



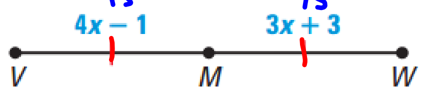
$$\boxed{\frac{x_1 + x_2}{2}}$$

$$\frac{10+20}{2} = \frac{30}{2} = 15$$

Aug 23-2:45 PM

ALGEBRA Point M is the midpoint of $\overline{VW}$. Find the length of $\overline{VM}$.

$4(4)-1$ | $3(4)+3$
$16-1$ | $12+3$
15 ✓ 15



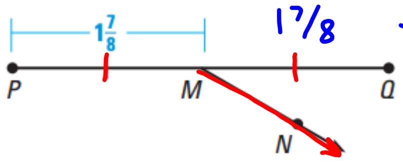
$$VM = 4x-1$$
$$= 4(4)-1$$
$$= 16-1$$
$$= 15$$

$$4x - 1 = 3x + 3$$
$$-3x \qquad -3x$$
$$x - 1 = 3$$
$$+1 \qquad +1$$
$$x = 4$$

Aug 26-8:39 PM

In Exercises 1 and 2, identify the segment bisector of $\overline{PQ}$. Then find PQ.

1.



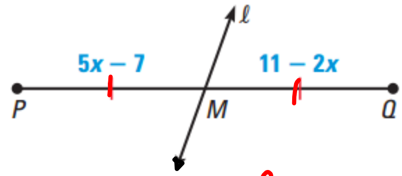
Ray $\overrightarrow{MN}$

$PQ = 2(1^7/_8)$

$= \frac{30}{8}$

$= \frac{15}{4}$ or $3^3/_4$

2.



Line ℓ

$$5x - 7 = 11 - 2x$$
$$+2x \qquad +2x$$
$$7x - 7 = 11$$
$$+7 \quad +7$$
$$\frac{7x}{7} = \frac{18}{7}$$
$$x = \frac{18}{7}$$

$PM = 5x - 7$

$= 5\left(\frac{18}{7}\right) - 7$

$= \frac{41}{7}$

$PQ = 2PM$

$= 2\left(\frac{41}{7}\right)$

$= \frac{82}{7}$

Aug 26-8:43 PM

Coordinate Plane Midpoint Formula -

In the coordinate plane, the midpoint of the segment with endpoints (x_1, y_1) and (x_2, y_2)

Ex $\left(\frac{-2+6}{2}, \frac{4+-2}{2}\right)$

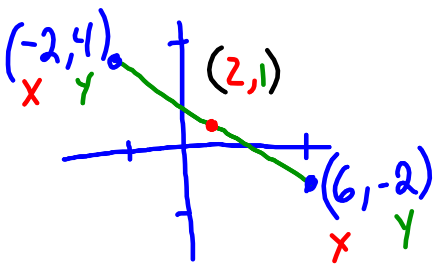
$\left(\frac{4}{2}, \frac{2}{2}\right)$

$(2, 1)$

The Midpoint Formula

The coordinates of the midpoint of a segment are the averages of the x-coordinates and of the y-coordinates of the endpoints.

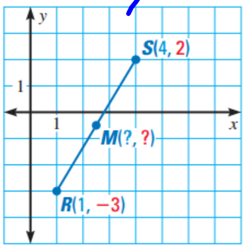
$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$



Aug 26-8:34 PM

a. FIND MIDPOINT The endpoints of $\overline{RS}$ are $R(1, -3)$ and $S(4, 2)$. Find the coordinates of the midpoint M.

x y x y



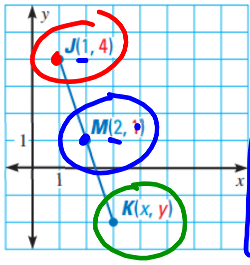
$$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

$$\left(\frac{1+4}{2}, \frac{-3+2}{2}\right)$$

$$\left(\frac{5}{2}, -\frac{1}{2}\right)$$

b. FIND ENDPOINT The midpoint of $\overline{JK}$ is $M(2, 1)$. One endpoint is $J(1, 4)$. Find the coordinates of endpoint K.

$K = (3, -2)$



$J(1, 4)$

$M(2, 1)$

$\boxed{K(3, -2)}$

Aug 26-8:47 PM

The Distance Formula

Distance formula on the Coordinate Plane

- the distance d between two points (x_1, y_1) and (x_2, y_2) in the coordinate plane is given by the formula

$$\mathbf{d} = AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

What is the approximate length of $\overline{RS}$ with endpoints $R(2, 3)$ and $S(4, -1)$?

x_1 y_1

x_2 y_2

$$RS = \sqrt{(4-2)^2 + (-1-3)^2}$$

$$= \sqrt{2^2 + (-4)^2}$$

$$= \sqrt{4+16}$$

$$= \sqrt{20}$$

$$= \sqrt{4}\sqrt{5}$$

$$= 2\sqrt{5} \approx 4.47$$

Aug 26-8:31 PM

HW: Pg 19 #'s 1, 2, 3-21 odds, 25-45 odds, 52, 53

Aug 26-7:17 AM

Aug 25-1:46 PM