Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

Find the coordinate of the midpoint of the segment with the given endpoints on number line.

1. Segment $\overline{QR}$

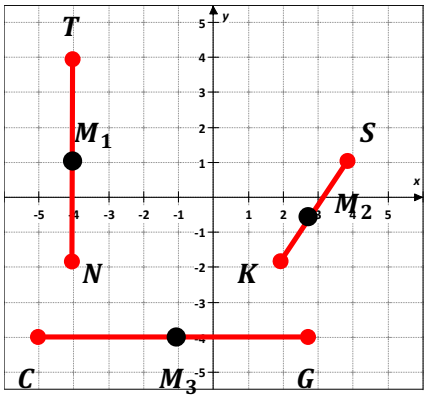
$x_1 = -4$ $x_2 = 0$

2. Segment $\overline{PS}$

$x_1 = -8$ $x_2 = -4$

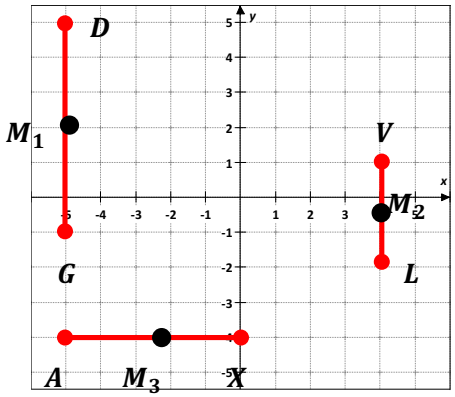
Record the coordinates of the segment`s end points and the coordinates of the segment`s midpoint in the table below.

3.



Endpoint	Endpoint Coordinates	Endpoint	Endpoint Coordinates	Midpoint	Midpoint Coordinates
T		N		M_1	
S		K		M_2	
C		G		M_3	

4.



Endpoint	Endpoint Coordinates	Endpoint	Endpoint Coordinates	Midpoint	Midpoint Coordinates
D		G		M_1	
V		L		M_2	
A		X		M_3	

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

Find the coordinate of the midpoint of the segment with the given endpoints in the coordinate plane.

5. Segment $\overline{AV}$
$A(4, 12)$ $V(-6, -3)$

6. Segment $\overline{PO}$
$P(-5, 10)$ $O(13, 24)$

7. Segment $\overline{KL}$
$K(12, 12)$ $L(-6, 6)$

8. Segment $\overline{IJ}$
$I(-6, -12)$ $J(-18, 22)$

Find the other endpoint of the line segment with the given endpoint and midpoint.

9. $Endpoint\ (1, 12)$ $Midpoint\ (3, -3)$

10. $Endpoint\ (2, 8)$ $Midpoint\ (-3, 4)$

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

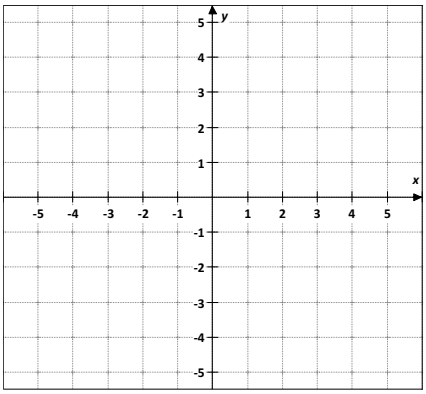
11. $\boldsymbol{Endpoint}\ (5, 6)\quad \boldsymbol{Midpoint}\quad (4, -6)$

12. $\boldsymbol{Endpoint}\ (-6, 0)\quad \boldsymbol{Midpoint}\quad (0, -1)$

Find the distance between each pair of points. Round to the nearest tenth.

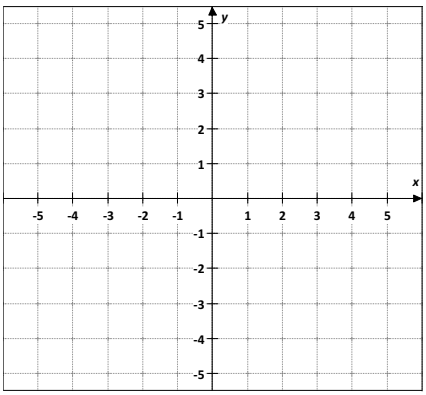
13. $R(-4, 1)$ $\qquad$ $F(0, -2)$

$d(R, F) = ?$



14. $A(-2, 4)$ $\qquad$ $N(3, -3)$

$d(A, N) = ?$

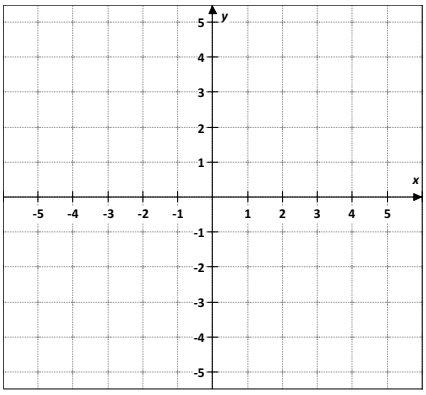


Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

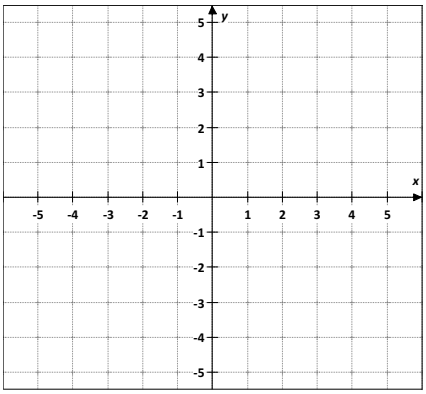
15. $B(1, 2)$ $W(-5, -5)$

$d(B, W) = ?$



16. $E(-2, 4)$ $N(5, 4)$

$d(E, N) = ?$



WORD PROBLEM

17. Determine the point N on the x-axis that is equidistant from $A(1, 2)$ and $B(2, -2)$.

Name: _____ Period: _____ Date: _____

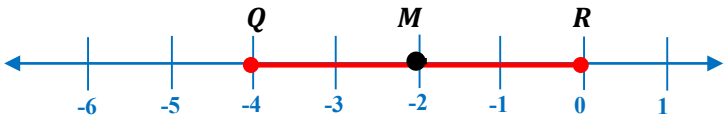
Midpoint and Distance in the Coordinate Plane Assignment

ANSWERS

Find the coordinate of the midpoint of the segment with the given endpoints on number line.

1. Segment $\overline{QR}$

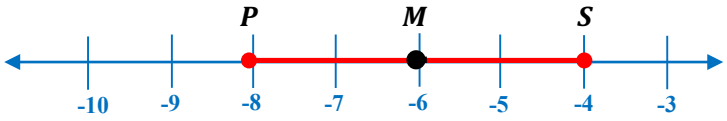
$x_1 = -4$ $x_2 = 0$



$$M = \frac{x_1 + x_2}{2}$$
$$M = \frac{-4 + 0}{2}$$
$$M = \frac{-4}{2}$$
$$M = -2$$

2. Segment $\overline{PS}$

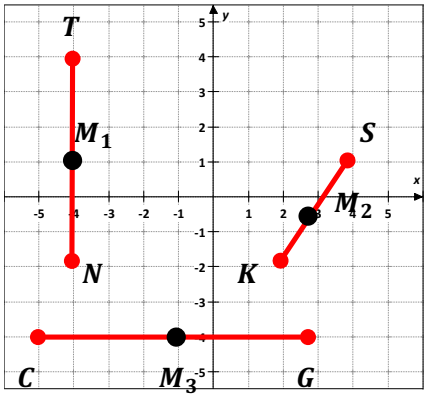
$x_1 = -8$ $x_2 = -4$



$$M = \frac{x_1 + x_2}{2}$$
$$M = \frac{-8 + (-4)}{2}$$
$$M = \frac{-12}{2}$$
$$M = -6$$

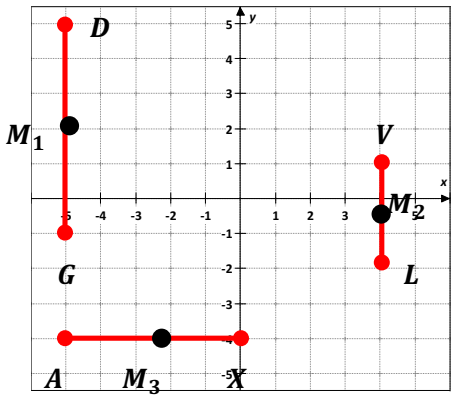
Record the coordinates of the segment`s end points and the coordinates of the segment`s midpoint in the table below.

3.



Endpoint	Endpoint Coordinates	Endpoint	Endpoint Coordinates	Midpoint	Midpoint Coordinates
T	$(-4, 4)$	N	$(-4, -2)$	M_1	$(-4, 1)$
S	$(4, 1)$	K	$(2, -2)$	M_2	$(3, -0.5)$
C	$(-5, -4)$	G	$(3, -4)$	M_3	$(1, -4)$

4.



Endpoint	Endpoint Coordinates	Endpoint	Endpoint Coordinates	Midpoint	Midpoint Coordinates
D	$(-5, 5)$	G	$(-5, -1)$	M_1	$(-5, 2)$
V	$(4, 1)$	L	$(4, -2)$	M_2	$(4, -0.5)$
A	$(-5, -4)$	X	$(0, -4)$	M_3	$(2.5, -4)$

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

Find the coordinate of the midpoint of the segment with the given endpoints in the coordinate plane.

5. Segment $\overline{AV}$

$A(4,12)$ $V(-6,-3)$

Segment $\overline{AV}$

$A(4,12)$ $V(-6,-3)$

$(x_1,y_1)=(4,12)$ $(x_2,y_2)=(-6,-3)$

$$M=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$
$$M=\left(\frac{4+(-6)}{2},\frac{12+(-3)}{2}\right)$$
$$M=\left(\frac{-2}{2},\frac{9}{2}\right)$$
$$M=(-1,4.5)$$

6. Segment $\overline{PO}$

$P(-5,10)$ $O(13,24)$

Segment $\overline{PO}$

$P(-5,10)$ $O(13,24)$

$(x_1,y_1)=(-5,10)$ $(x_2,y_2)=(13,24)$

$$M=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$
$$M=\left(\frac{-5+13}{2},\frac{10+24}{2}\right)$$
$$M=\left(\frac{8}{2},\frac{34}{2}\right)$$
$$M=(4,17)$$

7. Segment $\overline{KL}$

$K(12,12)$ $L(-6,6)$

Segment $\overline{KL}$

$K(12,12)$ $L(-6,6)$

$(x_1,y_1)=(12,12)$ $(x_2,y_2)=(-6,6)$

$$M=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$
$$M=\left(\frac{12+(-6)}{2},\frac{12+6}{2}\right)$$
$$M=\left(\frac{6}{2},\frac{18}{2}\right)$$
$$M=(3,9)$$

8. Segment $\overline{IJ}$

$I(-6,-12)$ $J(-18,22)$

Segment $\overline{IJ}$

$I(-6,-12)$ $J(-18,22)$

$(x_1,y_1)=(-6,-12)$ $(x_2,y_2)=(-18,22)$

$$M=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$
$$M=\left(\frac{-6+(-18)}{2},\frac{-12+22}{2}\right)$$
$$M=\left(\frac{-24}{2},\frac{10}{2}\right)$$
$$M=(-12,5)$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

9. *Endpoint* $(1,12)$ *Midpoint* $(3,-3)$

Endpoint $(1,12)$ *Midpoint* $(3,-3)$

$(x_1,y_1)=(1,12)$ $(x,y)=(3,-3)$

$$M_x=\frac{x_1+x_2}{2} \qquad M_y=\frac{y_1+y_2}{2}$$
$$3=\frac{1+x_2}{2} \qquad -3=\frac{12+y_2}{2}$$
$$6=1+x_2 \qquad -6=12+y_2$$
$$6-1=1-1+x_2 \qquad -6-12=12-12+y_2$$
$$x_2=5 \qquad y_2=-18$$

$(x_2,y_2)=(5,-18)$

10. *Endpoint* $(2,8)$ *Midpoint* $(-3,4)$

Endpoint $(2,8)$ *Midpoint* $(-3,4)$

$(x_1,y_1)=(2,8)$ $(x,y)=(-3,4)$

$$M_x=\frac{x_1+x_2}{2} \qquad M_y=\frac{y_1+y_2}{2}$$
$$-3=\frac{2+x_2}{2} \qquad 4=\frac{8+y_2}{2}$$
$$-6=2+x_2 \qquad 8=8+y_2$$
$$-6-2=2-2+x_2 \qquad 8-8=8-8+y_2$$
$$x_2=-8 \qquad y_2=0$$

$(x_2,y_2)=(-8,0)$

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

11. $\boldsymbol{Endpoint}\ (5,6)\quad \boldsymbol{Midpoint}\quad (4,-6)$

$\boldsymbol{Endpoint}\ (5,6)\quad \boldsymbol{Midpoint}\quad (4,-6)$

$(x_1,y_1)=(5,6)\qquad (x,y)=(4,-6)$

$$M_x=\frac{x_1+x_2}{2}\qquad M_y=\frac{y_1+y_2}{2}$$

$$4=\frac{5+x_2}{2}\qquad -6=\frac{6+y_2}{2}$$

$$8=5+x_2\qquad -12=6+y_2$$

$$8-5=5-5+x_2\qquad -12-6=6-6+y_2$$

$$x_2=3\qquad y_2=-18$$

$(x_2,y_2)=(3,-18)$

12. $\boldsymbol{Endpoint}\ (-6,0)\quad \boldsymbol{Midpoint}\quad (0,-1)$

$\boldsymbol{Endpoint}\ (-6,0)\quad \boldsymbol{Midpoint}\quad (0,-1)$

$(x_1,y_1)=(-6,0)\qquad (x,y)=(0,-1)$

$$M_x=\frac{x_1+x_2}{2}\qquad M_y=\frac{y_1+y_2}{2}$$

$$0=\frac{-6+x_2}{2}\qquad -1=\frac{0+y_2}{2}$$

$$0=-6+x_2\qquad -2=0+y_2$$

$$0+6=-6+6+x_2\qquad y_2=-2$$

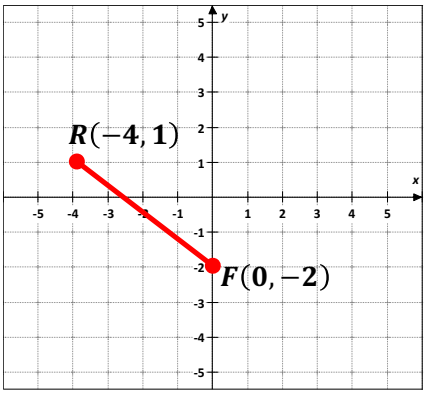
$$x_2=6$$

$(x_2,y_2)=(6,-2)$

Find the distance between each pair of points. Round to the nearest tenth.

13. $R(-4,1)\qquad F(0,-2)$

$d(R,F)=?$



$R(-4,1)\qquad F(0,-2)$

$(x_1,y_1)=(-4,1)\qquad (x_2,y_2)=(0,-2)$

$d(R,F)=?$

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

$$d(R,F)=\sqrt{(0-(-4))^2+(-2-1)^2}$$

$$d(R,F)=\sqrt{(4)^2+(-3)^2}$$

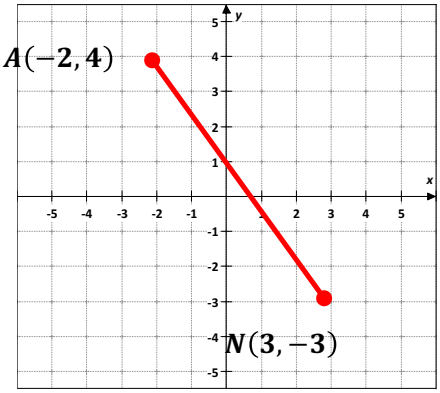
$$d(R,F)=\sqrt{16+9}$$

$$d(R,F)=\sqrt{25}$$

$d(R,F)=5$

14. $A(-2,4)\qquad N(3,-3)$

$d(A,N)=?$



$A(-2,4)\qquad N(3,-3)$

$(x_1,y_1)=(-2,4)\qquad (x_2,y_2)=(3,-3)$

$d(A,N)=?$

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

$$d(A,N)=\sqrt{(3-(-2))^2+(-3-4)^2}$$

$$d(A,N)=\sqrt{(3+2)^2+(-7)^2}$$

$$d(A,N)=\sqrt{(5)^2+(-7)^2}$$

$$d(A,N)=\sqrt{25+49}$$

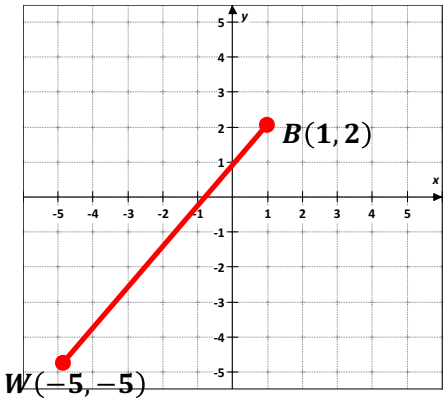
$$d(A,N)=\sqrt{74}$$

$d(A,N)\approx 8,6$

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment

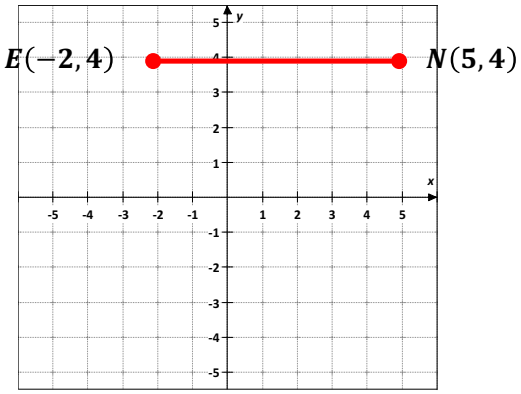
15. $B(1,2)$ $W(-5,-5)$
$d(B,W) = ?$



$B(1,2)$ $W(-5,-5)$
$(x_1,y_1) = (1,2)$ $(x_2,y_2) = (-5,-5)$
$d(B,W) = ?$

$$d(B,W) = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$d(B,W) = \sqrt{(-5-1)^2+(-5-2)^2}$$
$$d(B,W) = \sqrt{(-6)^2+(-7)^2}$$
$$d(B,W) = \sqrt{36+49}$$
$$d(B,W) = \sqrt{85}$$
$$d(B,W) \approx 9.2$$

16. $E(-2,4)$ $N(5,4)$
$d(E,N) = ?$



$E(-2,4)$ $N(5,4)$
$(x_1,y_1) = (-2,4)$ $(x_2,y_2) = (5,4)$
$d(E,N) = ?$

$$d(E,N) = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$d(E,N) = \sqrt{(5-(-2))^2+(4-4)^2}$$
$$d(E,N) = \sqrt{(5+2)^2+(0)^2}$$
$$d(E,N) = \sqrt{(7)^2+(0)^2}$$
$$d(E,N) = \sqrt{49+0}$$
$$d(E,N) = \sqrt{49}$$
$$d(E,N) = 7$$

WORD PROBLEM

17. Determine the point N on the x-axis that is equidistant from $A(1,2)$ and $B(2,-2)$.

$N(x,0)$
$A(1,2), N(x,0)$ *and* $B(2,-2)$

$$d(A,N) = d(B,N)$$
$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
$$\sqrt{(x-1)^2+(0-2)^2} = \sqrt{(x-2)^2+(0-(-2))^2}$$
$$(x-1)^2+(0-2)^2 = (x-2)^2+(2)^2$$
$$x^2-2x+1+4 = x^2-4x+4+4$$
$$x^2-2x+1+4-x^2 = x^2-4x+4+4-x^2$$
$$-2x+5 = -4x+8$$
$$-2x+5-5 = -4x+8-5$$
$$-2x = -4x+3$$
$$-2x+4x = -4x+3+4x$$
$$2x = 3$$
$$x = \frac{3}{2} \quad N\left(\frac{3}{2},0\right)$$

Name: _____ Period: _____ Date: _____

Midpoint and Distance in the Coordinate Plane Assignment