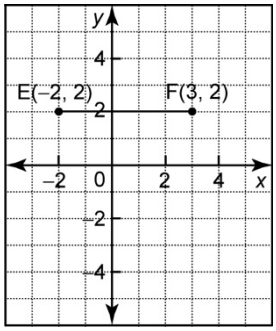
W1 – Midpoint and Length of a Line Segment Unit 2

MPM2D

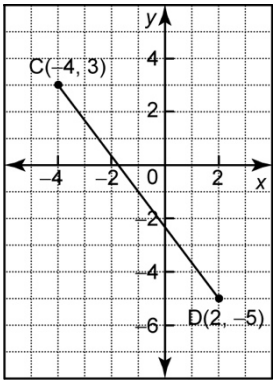
Jensen

1) Determine the coordinates of the midpoint of each line segment.

a)



b)



2) Determine the midpoint of the line segment defined by each pair of endpoints.

a) $J(5,7)$ and $K(3,9)$

b) $L(-1,0)$ and $M(1,-6)$

c) $A(5,9)$ and $B(-1,9)$

d) $C(-7,8)$ and $D(-2,-9)$

e) $E(\frac{-1}{9}, \frac{-1}{2})$ and $F(\frac{14}{9}, \frac{4}{3})$

f) $A\left(\frac{5}{3}, 1\right)$ and $B(0,2)$

g) $G\left(\frac{-3}{2}, \frac{-1}{3}\right)$ and $H\left(\frac{3}{4}, \frac{3}{5}\right)$

h) $M(6.6, 8.52)$ and $N(-5.5, 4.07)$

3) The endpoints of the diameter of a circle are $A(-5, -3)$ and $B(3, 7)$. Find the coordinates of the center of this circle.

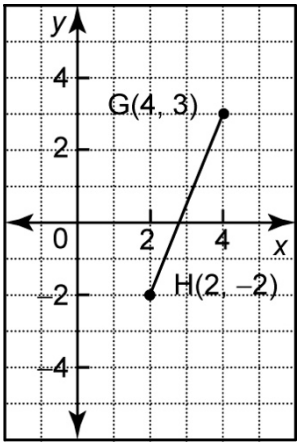
4) One endpoint of a diameter of a circle centered at the origin is $(-5, 2)$. Find the coordinates of the other endpoint of this diameter.

5) For a line segment DE, one endpoint is $D(6,5)$, and the midpoint is $M(4,2)$. Find the coordinates of endpoint E.

6) The endpoints of AB are $A(10,16)$ and $B(-6,-12)$. Find the coordinates of the points that divide the segment into four equal parts.

7) The endpoints of PQ are $P(3,-4)$ and $Q(11,c)$. The midpoint of PQ is $M(d,3)$. Find the values of c and d.

8) Find the exact length of the line segment.



9) Calculate the exact length of the line segment defined by each pair of endpoints.

a) A(-6, -2) and B(4, 3)

b) C(-2, 0) and D(7, -3)

c) E(-5, -6) and F(-1, -2)

d) G(0, 5) and H(8, -1)

e) (−5, 6) and (3, −2)

f) $\left(-\frac{3}{4}, -\frac{2}{5}\right)$ and $\left(\frac{1}{4}, \frac{3}{5}\right)$

10) On a street map of his town, Jordan's house has coordinates (8,1). The town's two high schools are at (0,5) and (6,11). Which school is closer to Jordan's house?

11) The vertices of ΔABC are $A(2,5)$, $B(-6,-1)$ and $C(10,-1)$.

a) Determine the length of each side of this triangle.

b) What is the perimeter of the triangle?

c) Classify the triangle.

12) A circle has a diameter with endpoints $R(-4, 6)$ and $T(10, -8)$.

a) Find the length of this diameter exactly.

b) Find the length of the radius of this circle. Round to the nearest tenth.

Answers

1)a) $\left(\frac{1}{2}, 2\right)$ **b)** $(-1, -1)$

2)a) $(4,8)$ **b)** $(0, -3)$ **c)** $(2,9)$ **d)** $\left(-\frac{9}{2}, -\frac{1}{2}\right)$ **e)** $\left(\frac{13}{18}, \frac{5}{12}\right)$ **f)** $\left(\frac{5}{6}, \frac{3}{2}\right)$ **g)** $\left(\frac{-3}{8}, \frac{2}{15}\right)$ **h)** $(0.549, 6.295)$

3) $(-1, 2)$

4) $(5, -2)$

5) $(2, -1)$

6) $(6,9)$, $(2,2)$, $(-2, -5)$

7) $c = 10, d = 7$

8) $\sqrt{29}$

9)a) $\sqrt{125} = 5\sqrt{5}$ **b)** $\sqrt{90} = 3\sqrt{10}$ **c)** $\sqrt{32} = 4\sqrt{2}$ **d)** 10 **e)** $\sqrt{128} = 8\sqrt{2}$ **f)** $\sqrt{2}$

10) The school at $(0,5)$ is closer to Jordan's house.

11)a) $AB = AC = 10, BC = 16$ **b)** 36 units **c)** isosceles

12)a) $\sqrt{392} = 14\sqrt{2}$ **b)** $7\sqrt{2}$