

① $\frac{3+5}{2} = 4$ ② $\frac{-7+4}{2} = 1.5$ ③ $\frac{5+(-9)}{2} = -2$ ④ $\frac{-6+10}{2} = -8$

⑤ $\left(\frac{6+4}{2}, \frac{7+3}{2}\right)$ ⑥ $\left(\frac{-1+2}{2}, \frac{5+3}{2}\right)$ ⑦ $\left(\frac{14+7}{2}, \frac{-2+8}{2}\right)$ ⑧ $\left(\frac{0+5}{2}, \frac{0+12}{2}\right)$
 $(5, 5)$ $(.5, 1)$ $(10.5, -5)$ $(-2.5, 6)$

⑨ $\left(\frac{2.8+1.1}{2}, \frac{-3.4+5.7}{2}\right)$ ⑩ $\left(2\frac{1}{2} + 3\frac{1}{4}, -\frac{1}{4} + -1\right)$
 $(-0.3, 3.4)$ $\left(\frac{2\frac{2}{4} + 3\frac{1}{4}}{2}, -\frac{5}{4}\right)$

⑪ ~~$(2) \frac{3+x}{2} = 0$~~ ~~$(2) \frac{-5+y}{2} =$~~
 ~~$\frac{3+x}{-3} = \frac{0}{-3}$~~
 ~~$x = -3$~~

$\left(\frac{5\frac{3}{4}}{2}, -\frac{5}{2}\right)$
 $\left(2\frac{7}{8}, -\frac{5}{8}\right)$

⑫ $(2) \frac{0+x}{2} = 3$ $(2) \frac{2+y}{2} = -5$
 $\frac{0+x}{-2} = \frac{6}{-2}$ $\frac{2+y}{-2} = \frac{-10}{-2}$
 $x = 6$ $y = -12$
 $(6, -12)$

⑫ $(2) \frac{-10+x}{2} = 3$ $(2) \frac{5+y}{2} = -5$
 $\frac{-10+x}{+10} = \frac{6}{+10}$ $\frac{5+y}{-5} = \frac{-10}{-5}$
 $x = 16$ $y = -15$
 $(16, -15)$

⑬ $(2) \frac{7+x}{2} = 3$ $(2) \frac{1+y}{2} = -5$
 $\frac{7+x}{-7} = \frac{6}{-7}$ $\frac{1+y}{-1} = \frac{-10}{-1}$
 $x = -1$ $y = -11$
 $(-1, -11)$

⑭ $(2) \frac{4+x}{2} = 3$ $(2) \frac{-8+y}{2} = -5$
 $\frac{4+x}{-4} = \frac{6}{-4}$ $\frac{-8+y}{+8} = \frac{-10}{+8}$
 $x = 2$ $y = -2$
 $(2, -2)$

$$\textcircled{15} \quad (2) \quad \frac{-1+x}{2} = 3 \quad (2)$$

$$\begin{array}{r} -1+x = 6 \\ +1 \quad +1 \\ \hline x = 7 \end{array}$$

$$(7, -1)$$

$$\textcircled{15} \quad (2) \quad \frac{-9+y}{2} = -5 \quad (2)$$

$$\begin{array}{r} -9+y = -10 \\ +9 \quad +9 \\ \hline y = -1 \end{array}$$

$$\textcircled{16} \quad (2) \quad \frac{2.5+x}{2} = 3 \quad (2) \quad (2) \quad \frac{-6.5+y}{2} = -5 \quad (2)$$

$$\begin{array}{r} 2.5+x = 6 \\ -2.5 \quad -2.5 \\ \hline x = 3.5 \end{array} \quad \begin{array}{r} -6.5+y = -10 \\ +6.5 \quad +6.5 \\ \hline y = -3.5 \end{array}$$

$$(3.5, -3.5)$$

$$\textcircled{17} \quad d = \sqrt{(6-7)^2 + (7-7)^2}$$

$$d = \sqrt{1^2 + 0^2}$$

$$d = \sqrt{1}$$

$$d = 1$$

$$\textcircled{18} \quad d = \sqrt{(5-5)^2 + (-5-3)^2}$$

$$d = \sqrt{0^2 + (-8)^2}$$

$$d = \sqrt{64}$$

$$d = 8$$

$$\textcircled{19} \quad d = \sqrt{(-1-12)^2 + (0-0)^2}$$

$$d = \sqrt{(-13)^2 + 0^2}$$

$$d = \sqrt{169}$$

$$d = 13$$

$$\textcircled{20} \quad d = \sqrt{(2-10)^2 + (-6-0)^2}$$

$$d = \sqrt{(-8)^2 + (-6)^2}$$

$$d = \sqrt{64 + 36}$$

$$d = \sqrt{100}$$

$$d = 10$$

$$\textcircled{21} \quad d = \sqrt{(20--4)^2 + (-4-3)^2}$$

$$d = \sqrt{24^2 + (-7)^2}$$

$$d = \sqrt{576 + 49}$$

$$d = \sqrt{625}$$

$$d = 25$$

$$\textcircled{22} \quad d = \sqrt{\cancel{(-5-3)^2} + (5-2)^2}$$

$$d = \sqrt{(-2)^2 + (7)^2}$$

$$d = \sqrt{4 + 49}$$

$$d = \sqrt{53}$$

$$\textcircled{23} \quad \text{length} = 6$$

$$\text{width} = 3$$

Just count THE SQUARES

$$\textcircled{24} \quad (10, 8) \quad (12, 10)$$

$$d = \sqrt{(10-12)^2 + (8-10)^2}$$

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

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

$$d = \sqrt{8}$$

$$d = 2\sqrt{2}$$

$$\text{length } 2\sqrt{2}$$

$$\text{width } 2\sqrt{2}$$

$$\textcircled{25} \quad (0, 5) \quad (4, 1)$$

$$d = \sqrt{(0-4)^2 + (5-1)^2}$$

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

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

$$d = \sqrt{32}$$

$$d = 4\sqrt{2} \quad \text{WIDTH}$$

$$(0, 5) \quad (5, 10)$$

$$d = \sqrt{(0-5)^2 + (5-10)^2}$$

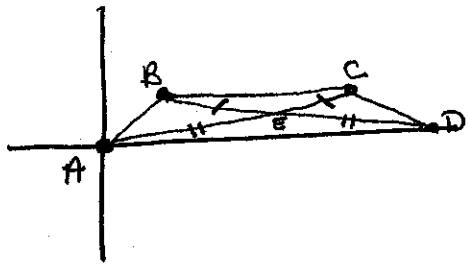
$$d = \sqrt{(-5)^2 + (-5)^2}$$

$$d = \sqrt{25+25}$$

$$d = \sqrt{50}$$

$$d = 5\sqrt{2} \quad \text{LENGTH}$$

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$$A(0,0)$$

$$B(3,3)$$

$$C(9,3)$$

$$D(12,0)$$

$$E(6,2)$$

$$BE = \sqrt{(3-6)^2 + (3-2)^2}$$

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

$$= \sqrt{9+1}$$

$$= \sqrt{10}$$

$$CE = \sqrt{(9-6)^2 + (3-2)^2}$$

$$= \sqrt{3^2 + 1^2}$$

$$= \sqrt{9+1}$$

$$= \sqrt{10}$$

$$\overline{BE} \cong \overline{CE}$$

$$AE = \sqrt{(0-6)^2 + (0-2)^2}$$

$$= \sqrt{(-6)^2 + (-2)^2}$$

$$= \sqrt{36+4}$$

$$= \sqrt{40}$$

$$= 2\sqrt{10}$$

$$DE = \sqrt{(12-6)^2 + (0-2)^2}$$

$$= \sqrt{6^2 + (-2)^2}$$

$$= \sqrt{36+4}$$

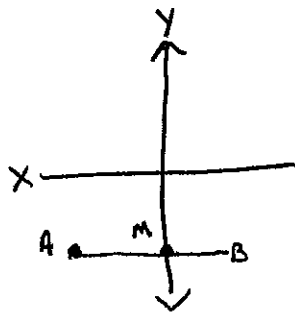
$$= \sqrt{40}$$

$$= 2\sqrt{10}$$

$$\overline{AE} \cong \overline{DE}$$

They divide each other into congruent segments

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Answer

IV

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(2, 6) (4, -4)

$$\begin{aligned}
 XY &= \sqrt{(2-4)^2 + (6-(-4))^2} \\
 &= \sqrt{(-2)^2 + 10^2} \\
 &= \sqrt{4 + 100} \\
 &= \sqrt{104} \\
 &= \underline{\underline{10.2}}
 \end{aligned}$$

MIDPOINT

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

$$\left(\frac{6}{2}, \frac{2}{2} \right)$$

$$\underline{\underline{(3, 1)}}$$

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(3, -3) (-12, -6)

$$\begin{aligned}
 XY &= \sqrt{(3-(-12))^2 + (-3-(-6))^2} \\
 &= \sqrt{15^2 + 3^2} \\
 &= \sqrt{225 + 9} \\
 &= \sqrt{234} \\
 &= \underline{\underline{15.3}}
 \end{aligned}$$

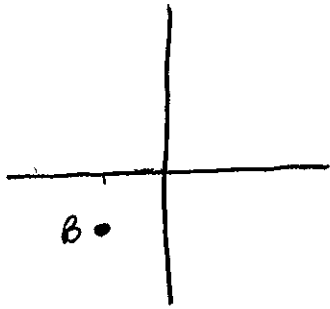
MIDPOINT

$$\left(\frac{3+(-12)}{2}, \frac{-3+(-6)}{2} \right)$$

$$\left(\frac{-9}{2}, \frac{-9}{2} \right)$$

$$\underline{\underline{(-4.5, -4.5)}}$$

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EXAMPLE

$$\textcircled{a} \quad (1) \frac{-3+x}{2} = 5 \quad (2) \frac{-3+y}{2} = 6 \quad (3)$$

$$\begin{array}{r} -3+x=10 \\ +3 \quad +3 \\ \hline x=13 \end{array}$$

$$\begin{array}{r} -3+y=12 \\ +3 \quad +3 \\ \hline y=15 \end{array}$$

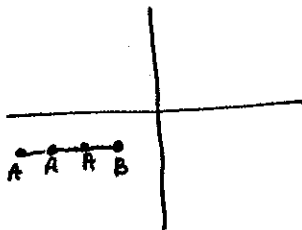
MIDPOINT (5,6)

ENDPOINT (13,15)

Answers will VARY. Select a midpoint answer of your choosing. Then solve for the other endpoint using the midpoint you chose.

b) If the segment is entirely in QIII, the both endpoints will be in QIII.

c) Infinite number of segments because they can be different lengths.



31) CLOSET 1

(0,4) (5,9)

(0+4 / 2, 4+9 / 2)

(4 / 2, 13 / 2)

(2, 6.5)

$$\begin{aligned} d &= \sqrt{(0-5)^2 + (4-9)^2} \\ &= \sqrt{25 + 25} \\ &= \sqrt{50} \\ &= 5\sqrt{2} \text{ or } 7.1 \end{aligned}$$

CLOSET 2

(7,5) (10,9)

(7+10 / 2, 5+9 / 2)

(17 / 2, 14 / 2)

(8.5, 7)

$$\begin{aligned} d &= \sqrt{(7-10)^2 + (5-9)^2} \\ d &= \sqrt{9 + 16} \\ d &= \sqrt{25} \\ d &= 5 \end{aligned}$$

CLOSET 3

(0,0) (9,3)

(0+9 / 2, 0+3 / 2)

(9 / 2, 3 / 2)

(4.5, 1.5)

$$\begin{aligned} d &= \sqrt{(0-9)^2 + (0-3)^2} \\ d &= \sqrt{81 + 9} \\ d &= \sqrt{90} \\ d &= 3\sqrt{10} \text{ or } 9.5 \end{aligned}$$