

Name: Key

Period: _____

Accelerated GSE Geometry B / Algebra II

Distance, Midpoint and Slope Worksheet

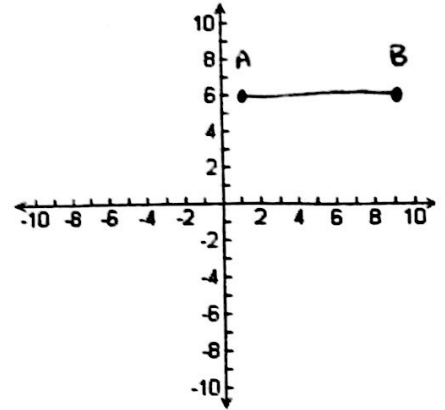
Part 1: Graphing

1) Graph the points A (1, 6) and B (9, 6). Find the midpoint of \overline{AB} . Find the distance of \overline{AB} .
Find the slope of \overline{AB} .

Midpoint
$$\left(\frac{1+9}{2}, \frac{6+6}{2}\right)$$
$$(5, 6)$$

Distance
$$\sqrt{(9-1)^2 + (6-6)^2}$$
$$= \sqrt{8^2 + 0^2}$$
$$= \sqrt{8^2}$$
$$= 8$$

Slope
$$\frac{6-6}{9-1} = \frac{0}{8} = 0$$

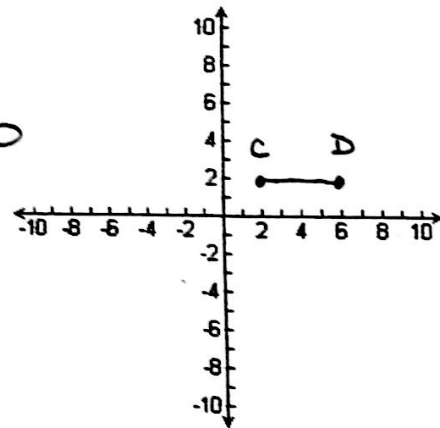


2) Graph the points C (2, 2) and D (6, 2). Find the midpoint of \overline{CD} . Find the distance of \overline{CD} .
Find the slope of \overline{CD} .

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

Distance
$$\sqrt{(6-2)^2 + (2-2)^2}$$
$$= \sqrt{4^2 + 0^2}$$
$$= \sqrt{4^2}$$
$$= 4$$

Slope
$$\frac{2-2}{6-2} = \frac{0}{4} = 0$$

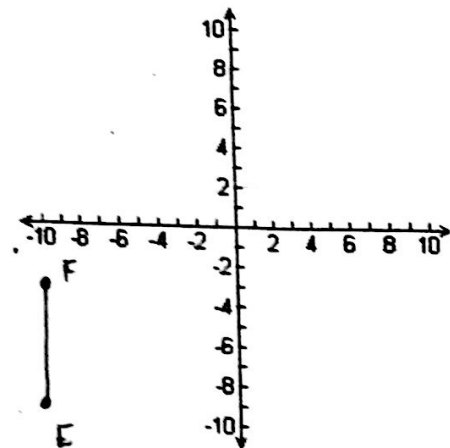


3) Graph the points E (-10, -9) and F (-10, -3). Find the midpoint of \overline{EF} . Find the distance \overline{EF} .
Find the slope of \overline{EF} .

Midpoint
$$\left(\frac{-10+(-10)}{2}, \frac{-9+(-3)}{2}\right)$$
$$(-10, -6)$$

Distance
$$\sqrt{(-10-(-10))^2 + (-3-(-9))^2}$$
$$= \sqrt{(0)^2 + (-3+9)^2}$$
$$= \sqrt{0 + 36}$$
$$= \sqrt{36}$$
$$= 6$$

Slope
$$\frac{-3-(-9)}{-10-(-10)}$$
$$= \frac{-3+9}{-10+10}$$
$$= \frac{6}{0}$$
$$= \text{undefined}$$



Part 2: Midpoint Using Formula Only

Find the midpoint for each line segment using the formula (no graphing needed). Show the formula and all work.

4) G (6, 5) and H (9, 2)

$$\left(\frac{6+9}{2}, \frac{5+2}{2} \right) \\ = \left(\frac{15}{2}, \frac{7}{2} \right)$$

5) I (1, 1) and J (-3, -3)

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

6) K (1, -1) and L (8, -7)

$$\left(\frac{1+8}{2}, \frac{-1+(-7)}{2} \right) = \left(\frac{9}{2}, -4 \right)$$

Part 3: Distance Using Formula Only

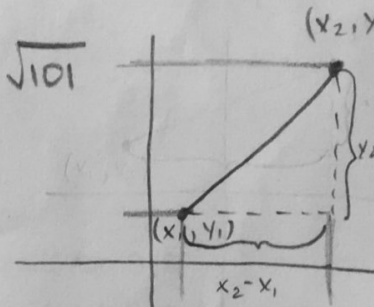
Find the distance between each set of points (round to 2 decimal places if needed, no graphing needed). Show the formula and all work.

7) (0, 0) and (4, 3)

$$\sqrt{(4-0)^2 + (3-0)^2} = \sqrt{16+9} = \sqrt{25} = 5$$

8) (3, -3) and (2, 7)

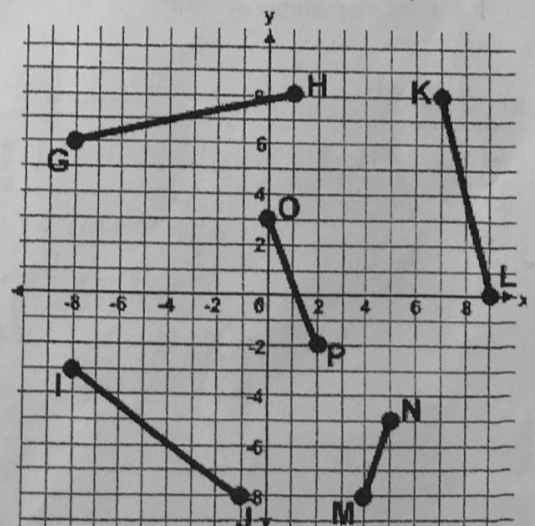
$$\sqrt{(2-3)^2 + (7-(-3))^2} = \sqrt{1+100} = \sqrt{101}$$



9) Determine the coordinates of the points needed. Then find the distance of each line segment (round to 2 dp):

a) GH G(-8, 6) H(1, 8)

b) KL K(7, 8) L(9, 0)



Part 4: Slope Using Formula Only

Find the slope of the line joining each set of points (round to 2 decimal places if needed, no graphing needed). Show the formula and all work.

10) G (6, 5) and H (9, 2) $\frac{5-2}{6-9} = \frac{3}{-3} = -1$

11) I (1, 1) and J (-3, -3) $\frac{1-(-3)}{1-(-3)} = \frac{1+3}{1+3} = \frac{4}{4} = 1$

12) K (1, -1) and L (8, -7) $\frac{-1-(-7)}{1-8} = \frac{-1+7}{1-8} = \frac{6}{-7}$

13) M (0, 0) and N (0, 3) $\frac{0-3}{0-0} = \frac{-3}{0} = \text{und}$

14) P (-3, 0) and Q (2, 0) $\frac{0-0}{-3-2} = \frac{0}{-5} = 0$

Part 5: Putting it All Together

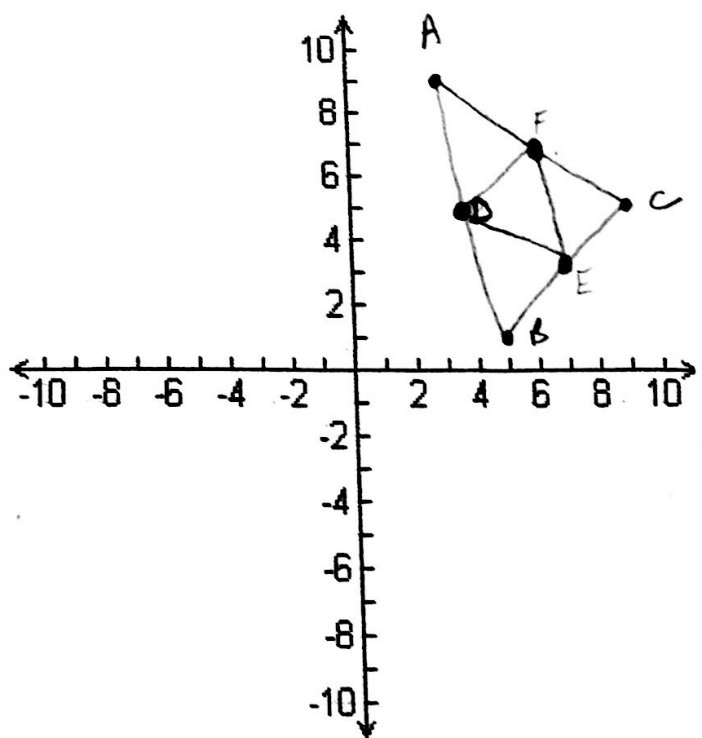
13) Triangle ABC has coordinates A (3, 9), B (5, 1) and C (9, 5). D is the midpoint of AB, E is the midpoint of BC and F is the midpoint of CA.

a) Graph the points A, B, and C (make sure you label them). Find the coordinates of points D, E, and F. Show all work.

$$D = \left(\frac{3+5}{2}, \frac{9+1}{2} \right) = (4, 5)$$

$$E = \left(\frac{5+9}{2}, \frac{1+5}{2} \right) = (7, 3)$$

$$F = \left(\frac{3+9}{2}, \frac{9+5}{2} \right) = (6, 7)$$



b) Plot points D, E and point F on the graph and label.

c) Find the length of DE, EF and FD. Show all work.

$$(i) \quad DE = (4,5) (7,3) \quad \sqrt{(7-4)^2 + (3-5)^2} = \sqrt{3^2 + (-2)^2} \\ = \sqrt{9+4} = \sqrt{13}$$

$$(ii) \quad EF = (7,3) (6,7) \quad \sqrt{(6-7)^2 + (7-3)^2} = \sqrt{(-1)^2 + 4^2} = \sqrt{1+16} = \sqrt{17}$$

$$(iii) \quad FD = (4,5) (6,7) \quad \sqrt{(6-4)^2 + (7-5)^2} = \sqrt{2^2 + 2^2} = \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$$

d) Find the slope of (i) AD

$$\frac{9-5}{3-4} = \frac{4}{-1} = -4$$

$$(ii) \quad BE \quad \frac{3-1}{7-5} = \frac{2}{2} = 1$$

$$(iii) \quad CF \quad \frac{7-5}{6-9} = \frac{2}{-3}$$