

Unit 5 Study Guide #2

Name _____ S _____

Match the quadrilateral with the description of the diagonal.

- C 1. parallelogram
- B 2. rectangle
- A 3. Rhombus
- D 4. Square

- ~~a.~~ perpendicular
- ~~b.~~ congruent
- ~~c.~~ bisect
- ~~d.~~ congruent and perpendicular

5 & 6, Write the equation of the line $y = 3x - 4$, and goes through $(3, -4)$

5) the line is parallel

$m = 3$

$m_{//} = 3$

$$y - y_1 = m(x - x_1)$$

$$y + 4 = 3(x - 3)$$

$$y + 4 = 3x - 9$$

$$y = 3x - 13$$

6) the line is perpendicular

$m = 3$

$m_{\perp} = -\frac{1}{3}$

$$y - y_1 = m(x - x_1)$$

$$y + 4 = -\frac{1}{3}(x - 3)$$

$$y + 4 = -\frac{1}{3}x + 1$$

$$y = -\frac{1}{3}x - 3$$

7. Given the points $(-4, 10)$ and $(-7, -4)$, find

a) the midpoint

$$\left(\frac{-4 + -7}{2}, \frac{10 + -4}{2} \right)$$

$$\left(-\frac{11}{2}, 3 \right)$$

b) the distance

$$= \sqrt{(-4 - -7)^2 + (10 - -4)^2}$$

$$= \sqrt{205}$$

a) the midpoint

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

$$\left(-\frac{5}{2}, -\frac{15}{2} \right)$$

b) the distance

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

$$= \sqrt{10}$$

For 9 & 10, Given the points $A(-3, 4)$ and $B(-7, 12)$, find the coordinates of the point P on the directed line segment AB that partitions in the ratio of

9) $1:3 = \frac{1}{4}$

$$\Delta x = x_2 - x_1 = -7 - -3 = -4 \left(\frac{1}{4} \right) = -1$$

$$\Delta y = y_2 - y_1 = 12 - 4 = 8 \left(\frac{1}{4} \right) = 2$$

$P(-3, 4)$
 $-1, 2$ $(-4, 6)$

10) $3:2 = \frac{3}{5}$

$$\Delta x = x_2 - x_1 = -7 - -3 = -4 \left(\frac{3}{5} \right) = -2.4$$

$$\Delta y = y_2 - y_1 = 12 - 4 = 8 \left(\frac{3}{5} \right) = 4.8$$

$P(-3, 4)$
 $-2.4, 4.8$ $(-5.8, 8.8)$

For 11 & 12, Given the center and the radius, determine if the given point lies on the circle.

$$(x - h)^2 + (y - k)^2 = r^2$$

11) Center: $(4, 1)$ and radius $= 8$, point T $(-4, 9)$
 $(-4 - 4)^2 + (9 - 1)^2 = 8^2$
 $128 \neq 64$ NO

12) Center: $(1, -2)$ and $r = 4$, point T $(3.4, 1.2)$
 $(3.4 - 1)^2 + (1.2 - -2)^2 = 16$
 $16 = 16$ YES

For 13 & 14, Find the length of the radius of the circle whose diameter has the given endpoints.

13) $(-4, 1)$ and $(4, -5)$

➤ Find midpoint: $\left(\frac{-4 + 4}{2}, \frac{1 + -5}{2} \right)$
 $(0, -2)$

➤ Take midpoint and one of endpoints and use distance formula.

14) $(-3, 2)$ and $(1, -5)$

➤ Find midpoint: $\left(\frac{-3 + 1}{2}, \frac{2 + -5}{2} \right)$
 $(-1, -1.5)$

➤ Take midpoint and one of endpoints and use distance formula.

(0, -2), (-4, 1)

= sqrt((0 - (-4))^2 + (-2 - 1)^2) = sqrt(25) = 5

= sqrt((-3 - 1)^2 + (2 - 7)^2) = 4.03

15 & 16, Find the length of the diameter of the circle with the center at the given point and the given point that lies on the circle.

center = (5, -3) and point T (2, 5)

r = sqrt((5 - 2)^2 + (-3 - 5)^2) = sqrt(73) Diameter = 2*sqrt(73)

16) center = (4, -3) and point T (1, 5)

r = sqrt((4 - 1)^2 + (-3 - 5)^2) = sqrt(73) Diameter = 2*sqrt(73)

17 & 18, Find the standard form of the circle given the equations below. Identify the center and radius.

x^2 + y^2 + 14x - 12y + 4 = 0

x^2 + 14x + 49 + y^2 - 12y + 36 = 4 + 49 + 36 (x+7)^2 + (y-6)^2 = 81

center: (-7, 6) r = 9

18) x^2 + y^2 + 6x - 2y + 1 = 0

x^2 + 6x + 9 + y^2 - 2y + 1 = -1 + 9 + 1 (x+3)^2 + (y-1)^2 = 9

Center: (-3, 1) r = 3

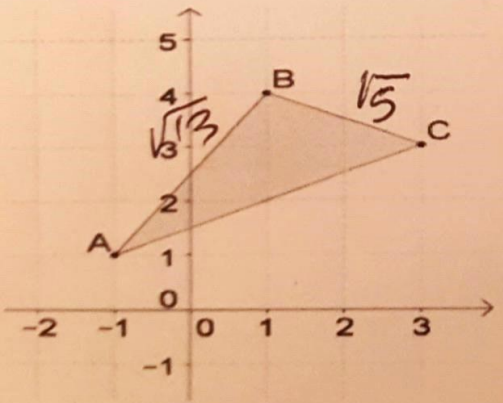
19) Quadrilateral ABCD has vertices A(2, -1), B(1, 3), C(6, 5), D(7, 1). Prove the Quadrilateral is a parallelogram.

Midpoints: A(2, -1), C(6, 5) -> (4, 2); B(1, 3), D(7, 1) -> (4, 2)

20) Quadrilateral FGHI has vertices F(-4, -1), G(-2, -5), H(4, -2), J(2, 2). Prove the parallelogram is a rectangle.

FH = sqrt((-4 - 4)^2 + (-1 - -2)^2) = sqrt(65); GJ = sqrt((-2 - 2)^2 + (-5 - 2)^2) = sqrt(65)

21) Given the triangle below, A(-1, 1), B(1, 4), C(3, 3)



a) Find the lengths/distances of each side. Put all the work below.

AB = sqrt((-1 - 1)^2 + (1 - 4)^2) -> sqrt(13) approx 3.6; BC = sqrt((1 - 3)^2 + (4 - 3)^2) -> sqrt(5) approx 2.2; AC = sqrt((-1 - 3)^2 + (1 - 3)^2) -> 2*sqrt(5) approx 4.5

b) Find the perimeter.

sqrt(13) + 2*sqrt(5) + sqrt(5) = sqrt(13) + 3*sqrt(5) approx 10.3

c) Find the area. A = 1/2bh

A = 1/2 * (sqrt(5)) * (sqrt(13)) approx 4.03

approx 4.03