Directions: Solve each problem.

12) If W(3, –4) is an endpoint of segment WT and the midpoint is (5, –2). What is the ordered pair that represents Point T?

$\boxed{(7,0)}$

x:

$5 = \frac{3+x}{2} \cdot 2$

$10 = 3 + x$

$-3 \quad -3$

$7 = x$

y:

$-2 = \frac{-4+y}{2} \cdot 2$

$-4 = -4 + y$

$+4 \quad +4$

$y = 0$

13) R(5, –5) and S(–3, 1) have a midpoint of (a, b). What is the value of a and b?

midpoint: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\left(\frac{5+-3}{2}, \frac{-5+1}{2}\right) = \boxed{(1,-2)}$

14) Segment RJ is partitioned at Point Q at a ratio of 3:5. If R(–1, 8) and J(15, 0). What is Point Q?

a b

$x_1 y_1 \quad x_2 y_2$

$\left(x_1 + \frac{a}{a+b}(x_2 - x_1),\ y_1 + \frac{a}{a+b}(y_2 - y_1)\right)$

$-1 + \left(\frac{3}{8}\right)(15+1) \qquad 8 + \left(\frac{3}{8}\right)(0-8)$

$5 \qquad 5 \qquad \boxed{(5,5)}$

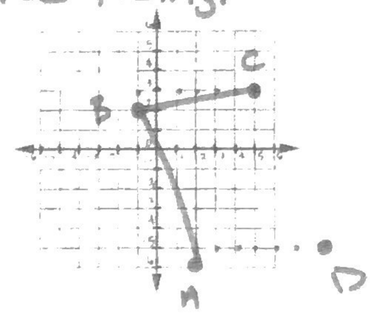
15) Cameron partitioned a segment at a ratio of 1:1. Lucy said she could split this segment another way. Explain how this is possible?

A ratio with the same # of parts is just cutting the segment in half. Finding midpoint is the same thing.

16) Three vertices of parallelogram *ABCD* are *A* (2, –6), *B* (–1, 2), and *C*(5, 3). Find the coordinates of vertex *D*.

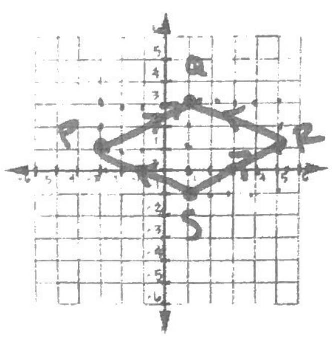
- Count from B to C.
- Do the same from A to D.

(up 1 over 6)



Directions: Plot the points and complete the coordinate proof.

17) Quadrilateral PQRS: P (-3, 1) Q (1, 3) R (5, 1) S (1, -1)



Prove parallelogram:

Slopes of $\overline{PS}: -\frac{2}{4} = -\frac{1}{2}$ > opp sides //

$\overline{QR}: -\frac{2}{4} = -\frac{1}{2}$

$\overline{PQ}: \frac{2}{4} = \frac{1}{2}$ > opp. sides //.

$\overline{SR}: \frac{2}{4} = \frac{1}{2}$

PQRS is Rhombus

Prove rhombus:

Are all 4 sides $\cong$? $\boxed{\text{YES}}$

$\overline{PQ} = 2^2 + 4^2 = x^2$ $\boxed{\sqrt{20}}$

$\overline{QR} = 2^2 + 4^2 = x^2$ $\boxed{\sqrt{20}}$

$\overline{SR} = 2^2 + 4^2 = x^2$ $\boxed{\sqrt{20}}$

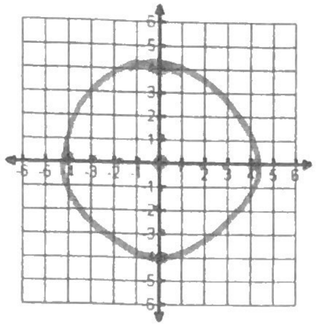
$\overline{PS} = 2^2 + 4^2 = x^2$ $\boxed{\sqrt{20}}$

Directions: Graph each circle. State the center and the radius.

18) $x^2 + y^2 = 16$

Center: $(0,0)$

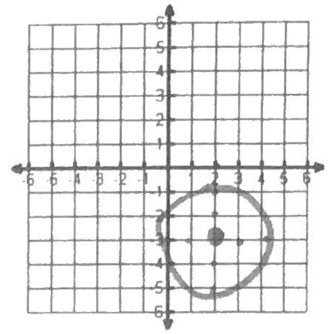
Radius: 4



19) $(x-2)^2 + (y+3)^2 = 4$

Center: $(2,-3)$

Radius: 2



Directions: Write the equation in standard form.

20) The center is (−2, 1) & diameter is 6 units.

$r=3$

$r^2=9$

$\boxed{(x+2)^2+(y-1)^2=9}$

21) General form is $x^2 + y^2 - 3x + 5y = 4$

$x^2-3x+\boxed{9/4}+y^2+5y+\boxed{\frac{25}{4}}=4+\boxed{9/4}+\boxed{\frac{25}{4}}$

$\left(\frac{-3}{2}\right)^2$ $\left(\frac{5}{2}\right)^2=$

$\boxed{\left(x-\frac{3}{2}\right)^2+\left(y+\frac{5}{2}\right)^2=12.5}$

22) The center is (2, 4) & is tangent to y = 0.

(x axis)

radius: 4

$\boxed{(x-2)^2+(y-4)^2=16}$

23) General form is $3x^2 + 3y^2 = 12x + 21$

$\frac{3x^2+3y^2=12x+21}{3}$

$x^2+y^2=4x+7$

$-4x \quad -4x$

$x^2-4x+\boxed{4}+y^2=7+\boxed{4}$

$\boxed{(x-2)^2+y^2=11}$

24) Has a diameter with endpoints (3, 0) & (−3, 8)

center: midpoint of diameter

$\left(\frac{3+-3}{2}, \frac{0+8}{2}\right)=(0,4)$

radius: distance of diameter ÷2.

$d=\sqrt{(-3-3)^2+(8-0)^2}$

$\sqrt{36+64}$

$\sqrt{100}=10$

radius is 5

$\boxed{x^2+(y-4)^2=25}$

25) Area is 16π units^2 and has a center at the origin

$\frac{\pi r^2}{\pi}=\frac{16\pi}{\pi}$

$r^2=16$

$r=4$

center: $(0,0)$

$\boxed{x^2+y^2=16}$

9.17 Unit 9 Test Review Name: ______________________

Directions: Determine if the lines are parallel, perpendicular, or coincidental. Explain why.

1) $\begin{cases} y = -2x - 3 \\ y = -2x + 3 \end{cases}$

$\boxed{\text{parallel}}$

2) $\begin{cases} 2y - 8x = -10 \\ y = 4x - 5 \end{cases}$

$\boxed{\text{Coincidental}}$

$2y = 8x - 10$

$y = 4x - 5$

3) $\begin{cases} y = -\frac{1}{3}x + 3 \\ y = \frac{3}{1}x + 3 \end{cases}$

$\boxed{\text{perpendicular}}$

Directions: Write an equation of a line with the following characteristics. $y = mx + b$

4) Is perpendicular to the equation y = 2x – 5 and has a y-intercept of 3.

b $m = -\frac{1}{2}$

$\boxed{y = -\frac{1}{2}x + 3}$

5) Is parallel to the equation y = 5x + 3.

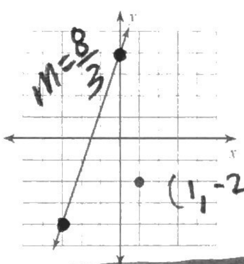
$y = 5x - 2$

$y = 5x + 100$

$\boxed{y = 5x \pm \#\text{ except } 3}$

Directions: Find each equation…

6) … that is parallel to the given line & passes through the given point.



$y = mx + b$

$y = \frac{8}{3}x + b$

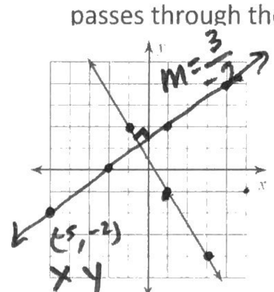
$-2 = \frac{8}{3}(1) + b$

$-2 = \frac{8}{3} + b$

$-\frac{14}{3} = b$

$\boxed{y = \frac{8}{3}x - \frac{14}{3}}$

7) … that is ⊥ to the given line & passes through the given point.



$m = \frac{2}{3}$

$y = \frac{2}{3}x + b$

$-2 = \frac{2}{3}(-5) + b$

$-2 = -\frac{10}{3} + b$

$\frac{4}{3} = b$

$\boxed{y = \frac{2}{3}x + \frac{4}{3}}$

Directions: Find the distance between each set of coordinates. Round your answer to the nearest tenth.

8) A(2, 5) & B(20, 5)

$x_1\ y_1 \quad x_2\ y_2$

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

$d = \sqrt{(20-2)^2 + (5-5)^2}$

$d = \sqrt{324}$

$\boxed{d = 18}$

9) C(1, 6) & D(-4, 0)

$x_1\ y_1 \quad x_2\ y_2$

$d = \sqrt{(-4-1)^2 + (0-6)^2}$

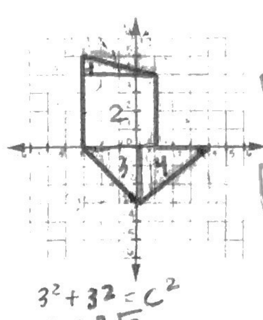
$d = \sqrt{(-5)^2 + (-6)^2}$

$d = \sqrt{25 + 36}$

$\boxed{d = \sqrt{61} \approx 7.8\,u}$

Directions: Find the perimeter and area of each shape.

10)



b⊥h

$p = 5 + 4 + 3 + 3\sqrt{2} + 5 + \sqrt{17}$

$\boxed{p = 17 + 3\sqrt{2} + \sqrt{17}}$

$\boxed{\text{Area}}$

① $\frac{1 \cdot 4}{2} = 2$

② $4 \cdot 4 = 16$

③ $\frac{3 \cdot 3}{2} = 4.5$

+ ④ $\frac{3 \cdot 4}{2} = 6$

$\boxed{A = 28.5\,u^2}$

$3^2 + 3^2 = c^2$

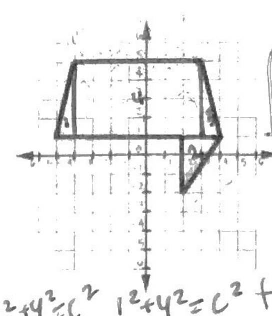
$c = 3\sqrt{2}$

$4^2 + 3^2 = c^2$

$c = 5$

$4^2 + 1^2 = c^2 = \sqrt{17}$

11)



$p = 7 + 3 + 7 + \sqrt{17} + \sqrt{13} + \sqrt{17}$

$\boxed{p = 17 + 2\sqrt{17} + \sqrt{13}}$

① $\frac{1 \cdot 4}{2} = 2$

② $3 \cdot 3/2 = 3$

③ $\frac{1 \cdot 4}{2} = 2$

+ ④ $7 \cdot 4 = 28$

$\boxed{A = 35\,u^2}$

$1^2 + 4^2 = c^2$

$c = \sqrt{17}$

$1^2 + 4^2 = c^2$

$c = \sqrt{17}$

$2^2 + 3^2 = c^2$

$c = \sqrt{13}$