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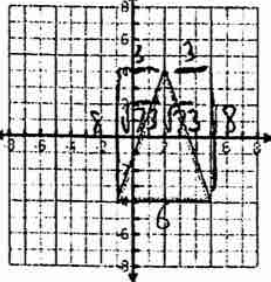
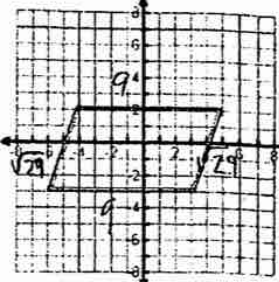
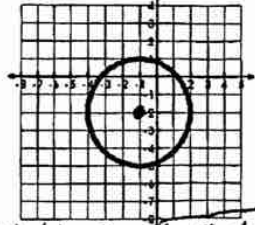
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Use the following to review for you test. Work the Practice Problems on a separate sheet of paper.

What you need to know & be able to do	Things to remember	Problem	Problem
Midpoint	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$	1. Find the midpoint of (5, 1) and (6, 7). $= \left(\frac{5+6}{2}, \frac{1+7}{2} \right)$ $= \left(\frac{11}{2}, \frac{8}{2} \right)$ $= \boxed{(5.5, 4)}$	2. Find the coordinates of the other endpoint of a segment with an endpoint of (-2, 2) and a midpoint (8, 3). $\boxed{(18, 4)}$ $(x, y) (-2, 2) \quad \boxed{(18, 4)}$ $-2+x = 8 \cdot 2 \quad 2+y = 3 \cdot 2$ $-2+x = 16 \quad 2+y = 6$ $x = 18 \quad y = 4$
Distance and Applications	<ul style="list-style-type: none"> Find the distance between two people. Pay attention to Direction: North and East are positive. South and West are negative 	3. Brandy and Mandy are in the pool playing a game of Marco Polo. Brandy swims 10 ft south and 7 ft east of base. Mandy swims 6 ft north and 5 ft west from where they started together in the middle of the pool. How far apart are Brandy and Mandy? $(7, -10)(5, 6) \quad d = \sqrt{(5-7)^2 + (-10-6)^2}$ $= \sqrt{(-2)^2 + (-16)^2}$ $= \boxed{20}$	4. Determine whether Point A (-5, 8) lies on the circle whose center is Point C (1, 2) and which contains the Point P (7, -4). $CP = \sqrt{(7-1)^2 + (-4-2)^2} \quad CA = \sqrt{(-5-1)^2 + (8-2)^2}$ $= \sqrt{72} \quad = \sqrt{72}$ $= 8.49 \quad \boxed{\text{Yes!}} \quad = 8.49$
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	<ul style="list-style-type: none"> Use Slope and Distance to prove that a shape is a specific type of quadrilateral or triangle Parallel and Perpendicular: Use Slope Congruent: Use Distance 	5. Given that a rhombus has 4 congruent sides and opposite sides parallel , prove the following is a rhombus. Lengths AB: 5 BC: $\sqrt{5^2+3^2} = \sqrt{34}$ CD: 5 DA: $\sqrt{5^2+3^2} = \sqrt{34}$ Slopes AB: 0 BC: 5/3 CD: 0 DA: 5/3	

GSE Geometry Support

8.7 - Modeling Test Review

<p>Perimeter and Area</p>	<ul style="list-style-type: none"> Perimeter: Distance Around an Object Area of a Parallelogram: Length * Height Area of a Triangle: $\frac{1}{2}(\text{base})(\text{height})$ Area of a Trapezoid: $\frac{1}{2}(b_1 + b_2)h$ 	<p>6. Find the area and perimeter of the figure.</p> $P = \sqrt{73} + \sqrt{73} + 6 = 23.09 \text{ units}$ $A = \frac{1}{2}bh = \frac{1}{2}(6)(8) = 24 \text{ units}^2$ 	<p>7. Find the area and perimeter of the figure.</p> $P = \sqrt{29} + \sqrt{29} + 9 + 9 = 28.77 \text{ units}$ $A = 9(5) = 45 \text{ units}^2$ 
<p>Writing the Equation of a Line</p>	<ul style="list-style-type: none"> Two Points: Find the slope, plug in slope and one point into $y=mx+b$ and solve for b, then sub m and b into slope intercept form Parallel: Use the slope and solve for b Perpendicular: Use the opposite reciprocal slope and solve for b 	<p>8. Write the equation of line that passes through the points (-5, -1) and (-3, 1).</p> $m = \frac{1 - (-1)}{-3 - (-5)} = \frac{2}{2} = 1$ $-1 = 1(-5) + b$ $-1 = -5 + b$ $4 = b$ $y = x + 4$	<p>9. Write the equation of line that passes through the points (2, 5) and (0, -1).</p> $m = \frac{-1 - 5}{0 - 2} = \frac{-6}{-2} = 3$ $5 = 3(2) + b$ $5 = 6 + b$ $b = -1$ $y = 3x - 1$
<p>Partitions</p> $(x_2 - x_1)\left(\frac{a}{a+b}\right) + x_1$ $(y_2 - y_1)\left(\frac{a}{a+b}\right) + y_1$	<ul style="list-style-type: none"> Use formulas 	<p>10. Write an equation of the line that passes through (-3, 4) and is parallel to $y = -3x - 1$.</p> $m = -3$ $4 = -3(-3) + b$ $4 = 9 + b$ $b = -5$ $y = -3x - 5$	<p>11. Write an equation of the line that passes through (5, -3) and is perpendicular to $y = -5/2x + 1$.</p> $m = 2/5$ $-3 = \frac{2}{5}(5) + b$ $-3 = 2 + b$ $b = -5$ $y = \frac{2}{5}x - 5$
<p>Circles</p> <p>Standard Form $(x-h)^2 + (y-k)^2 = r^2$</p> <p>General Form $Ax^2 + By^2 + Cx + Dy + E = 0$</p>	<p>Converting standard to general form</p> <ul style="list-style-type: none"> Multiply the binomials out by separating the terms that are square Combine like terms Set equal to 0 	<p>12. Find a point P on the segment with endpoints A(-1, -3) and B(7, 1) that partitions it in a 3:1 ratio.</p> $x \rightarrow -1 + (7 - (-1))\left(\frac{3}{4}\right) = 5$ $y \rightarrow -3 + (1 - (-3))\left(\frac{3}{4}\right) = 0$ $(5, 0)$ 	<p>13. Find a point T on the segment with endpoints C(-4, -6) and D(2, 3) that partitions it in a 2:1 ratio.</p> $x \rightarrow -4 + (2 - (-4))\left(\frac{2}{3}\right) = 0$ $y \rightarrow -6 + (3 - (-6))\left(\frac{2}{3}\right) = 0$ $(0, 0)$ <p>14. Write the equation of the circle in standard form.</p> $(x+1)^2 + (y+2)^2 = 9$
<p>15. Convert your answer from #14 to the General Form.</p> $(x+1)^2 + (y+2)^2 = 9$ $(x+1)(x+1) + (y+2)(y+2) = 9$ $x^2 + (x+x+1) + y^2 + 2y + 2y + 4 = 9$ $x^2 + 2x + 1 + y^2 + 4y + 4 = 9$ $x^2 + y^2 + 2x + 4y + 5 = 9$ $x^2 + y^2 + 2x + 4y - 4 = 0$			

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Unit 5 Review

1. Find an equation of the line that is **parallel** to $y = 2x + 8$ that passes through $(-6, 1)$.

$m = 2$
 $x = -6$
 $y = 1$

$y = mx + b$
 $1 = 2(-6) + b$
 -12

$b = 13$

$y = 2x + 13$

2. Find an equation of the line that is **perpendicular** to $y = 3x + 1$ that passes through $(9, -2)$.

$\perp m = -\frac{1}{3}$
 $x = 9$
 $y = -2$

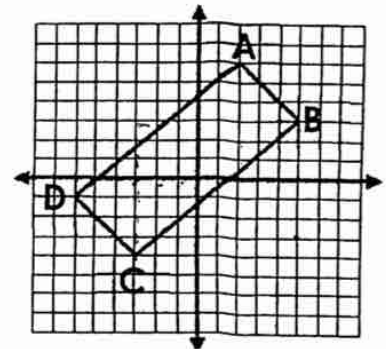
$-2 = -\frac{1}{3}(9) + b$
 $+3$
 $1 = b$

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

The following shape is a rectangle.

3. Prove that it's a parallelogram using the distances and slopes.

$AB \cong DC \checkmark$ $AB \parallel DC$
 $BC \cong AD \checkmark$ $BC \parallel AD$
 ✗ no right angles



4. The diagonals of a rhombus are perpendicular. Find the slopes of the diagonals to prove that it's not a rhombus.

$DB: \frac{4}{11}$

$CA: \frac{10}{5} = 2$

no b/c slopes aren't opp. reciprocals

5. Find the perimeter and area of the rectangle.

$P: 4.24 + 4.24 + 10.63 + 10.63 = 29.74$

$A: 4.24(10.63) = 45.07$

distance formula.

6. Josh and Drake decide to play catch after school. They start at the same point. Josh walks 50 feet north and 20 feet west. Drake walks 40 feet south and 10 feet east. How far apart are they?

$\sqrt{(10 - (-20))^2 + (-40 - 50)^2} = 94.9$

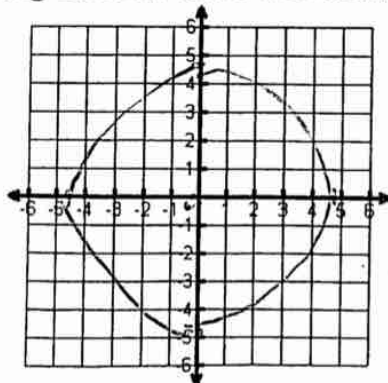
$(50, 20)$ $(-20, 10)$
 $(-20, 50)$ $(10, -40)$

Graph the following circles. State the center and radius.

7. $x^2 + y^2 = 24$

Center: $0, 0$

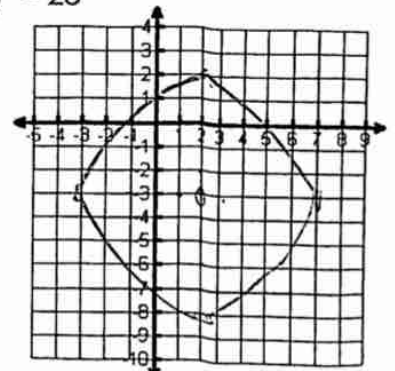
Radius: 4.9



8. $(x - 2)^2 + (y + 3)^2 = 25$

Center: $2, -3$

Radius: 5



Write the standard equation for the circle.

9. $x^2 + y^2 - 10x - 2y = -10$

$$x^2 - 10x + 25 + y^2 - 2y + 1 = -10 + 25 + 1$$

$$(x - 5)^2 + (y - 1)^2 = 16$$

Write the general form for circle.

10. $(x - 2)^2 + (y + 1)^2 = 9$

$$(x - 2)(x - 2) + (y + 1)(y + 1) = 9$$

$$x^2 - 2x - 2x + 4 + y^2 + y + y + 1 = 9$$

$$x^2 - 4x + y^2 + 2y + 5 = 9$$

$$x^2 - 4x + y^2 + 2y - 4 = 0$$

11. A circular disk drive has a diameter with endpoints at $(-9, 2)$ and $(15, 12)$. Find the center and radius of the disk drive. Write the equation of the circle in standard form.

Center: $(3, 7)$

use midpoint

$$\frac{-9 + 15}{2} = 3$$

$$\frac{2 + 12}{2} = 7$$

r = 13

distance between one point + center

Equation: $(x - 3)^2 + (y - 7)^2 = 169$

$$\sqrt{(-9 - 3)^2 + (2 - 7)^2} = 13$$

12. Find the midpoint of the points: $(-5, 3)$ $(2, 6)$.

$$\frac{-5 + 2}{2} = \frac{-3}{2}$$

$$\frac{3 + 6}{2} = \frac{9}{2}$$

$$\left(-\frac{3}{2}, \frac{9}{2}\right) \text{ or } (-1.5, 4.5)$$

13. Find the coordinates of the other endpoint of a segment with an endpoint of $(-1, 5)$ and a midpoint $(2, -3)$.

$E_1 (-1, 5)$

$$\frac{-1 + x}{2} = 2$$

$$\frac{5 + y}{2} = -3$$

$E_2 (x, y)$

$$-1 + x = 4$$

$$x = 5$$

$$\frac{5 + y}{2} = -6$$

$$5 + y = -12$$

$$y = -17$$

M $(2, -3)$

$$(5, -11)$$

14. Determine whether Point A lies on the circle whose center is Point C and which contains the Point P(0, 4). Justify your answer algebraically showing work.

Point A(3, $\sqrt{7}$); Point C(0, 0); Point P(0, 4)

find radius first

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

Then distance between A & C

$$\sqrt{(0 - 3)^2 + (0 - \sqrt{7})^2} = 4 \text{ because they're equal it is } \boxed{\text{YES}}$$

15. Find the coordinates of point T so that it partitions AB into a ratio of 1:3.

A(-8, -1) and B(12, 11)

$$x: -8 + \frac{1}{1+3}(12 - (-8)) = -3$$

$$y: -1 + \frac{1}{1+3}(11 - (-1)) = 2$$

$$\boxed{(-3, 2)}$$

$x_1 = -8$
 $x_2 = 12$
 $y_1 = -1$
 $y_2 = 11$

$a = 1$
 $b = 3$

③ Distances

slopes

$$AB: (2, 4) (5, 3)$$

$$AB: -3/3 = -1$$

$$\sqrt{(5-2)^2 + (3-4)^2} = 4.24$$

$$DC: (-6, -1) (-3, -4)$$

$$DC: -3/3 = -1$$

$$\sqrt{(-3-(-6))^2 + (-4-(-1))^2} = 4.24$$

$$BC: (5, 3) (-3, -4)$$

$$BC: -7/-8 = 7/8$$

$$\sqrt{(-3-5)^2 + (-4-3)^2} = 10.63$$

$$AD: (2, 4) (-6, -1)$$

$$AD: -7/-8 = 7/8$$

$$\sqrt{(-6-2)^2 + (-1-4)^2} = 10.63$$

④ ~~$DB: (-6, -1) (5, 3)$~~