Midpoints/Partitioning/Distance and Pythagorean/ Perimeter and Area Quiz Review

Name_____ , _____ Date_____
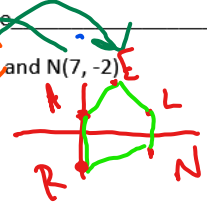
1. Find the perimeter of a figure with vertices at L(7, 1), E(4,5), A(0, 2), R(0, -5), and N(7, -2).

**27.62 units** add all sides

$NL = 3$
$RN = 7.62$
$AR = 7$
$LE = 5$
$+ EA = 5$

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

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

$RN = \sqrt{(7)^2 + (3)^2}$
$= \sqrt{49 + 9}$
$= \sqrt{58}$
$\approx 7.62$

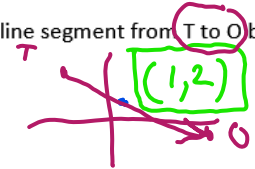2. Find the area of the right triangle with vertices, H(3, -2), O(8, -1) and W(6, 9).

$A_\triangle = \frac{1}{2}bh$
$A_\triangle = \frac{1}{2}(\sqrt{104})(\sqrt{26})$
$= 26 \text{ units}^2$

$b = WO = \sqrt{2^2 + (-10)^2}$
$= \sqrt{104}$
$h = OH = \sqrt{5^2 + 1}$
$= \sqrt{26}$

$\overline{OH} \, m = \frac{1}{5}$     $\overline{WO} \, m = \frac{-10}{2} = -5$
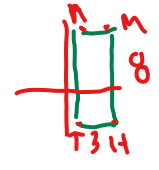
opposite reciprocals!

3. A line segment has endpoints T(-3,4) and O(7, -1). What point would partition the line segment from T to O by a ratio of 2:3?

a:b    start point + portion traveled (total distance)

$x: -3 + \frac{2}{5}(10)$     $y: 4 + \frac{2}{5}(-5)$
$x: 1$                          $4 - 2$
$y: 2$

$(1, 2)$

4. What is the area of a rectangle with points M(4, 5), A(1,5), T(1, -3) and H(4, -3).

$A = b \cdot h$        $TH = 3$
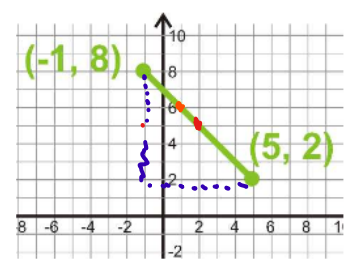$A = 3(8)$             $HM = 8$
$A = 24 \text{ units}^2$

5. A circle in the coordinate plane has a center at (5,3). What other point on the circle could create a line segment with the point on the circle (2, -1) to form a diameter of the circle.

$(2, -1)$
$c \, (5,3)$
$(8, 7)$
+3   +4

$(8, 7)$

6. What is the distance between the two graphed points? Round to the nearest tenth if necessary.

$d = \sqrt{6^2 + (-6)^2}$
$= \sqrt{36 + 36}$
$= \sqrt{72}$
$\approx 8.5 \text{ units}$

(-1, 8)     (5, 2)

7. What is the midpoint of the graphed line segment?

$\left(\frac{x_1 + x_2}{2} , \frac{y_1 + y_2}{2}\right)$          $(2, 5)$

a:b   A   B

8. What point would partition this line segment in a ratio of 1:2 from (-1,8) to (5,2)?
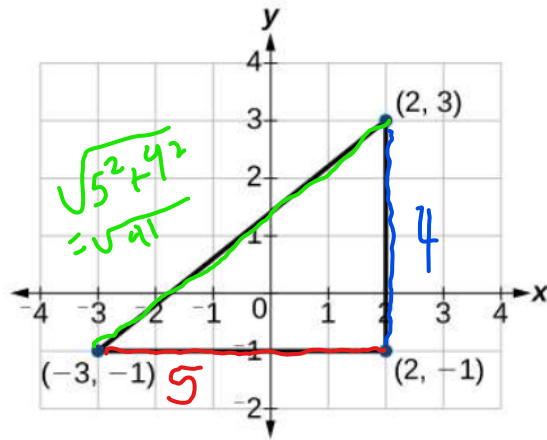
Start + portion traveled (total dist)

$x: -1 + \frac{1}{3}(6)$     $y: 8 + \frac{1}{3}(-6)$
$x: 1$                         $y: 6$

$(1, 6)$

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9. What is the perimeter of the triangle to the right?

$P = 5 + 4 + \sqrt{41}$

$P \approx 15.4$ units

10. What is the area of the triangle to the right?

$A_\triangle = \frac{1}{2}bh$

$= \frac{1}{2}(5)(4)$

$A = 10$ units$^2$

$\sqrt{5^2 + 4^2}$
$= \sqrt{41}$

(2, 3)

4

5

(−3, −1)    (2, −1)

11. Bill goes to We Sell All the Things by first going 3 miles North, then 1 mile West. Joe leaves from the same place Bill did but goes to the Fun Fun Park by first traveling 9 miles south then 4 miles East. How far is We Sell All the Things from the Fun Fun park?

$d = \sqrt{5^2 + 12^2}$

$d = \sqrt{169}$

$d = 13$ miles

12. If endpoints of a circles diameter are (3,11) and (-2, -1), what is the center of the circle?

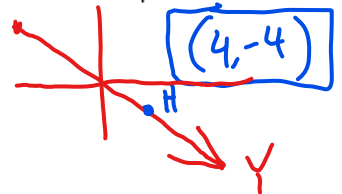$\left(\frac{3+-2}{2} = \frac{1}{2}, \quad \frac{11+-1}{2} = 5\right)$    $\left(\frac{1}{2}, 5\right)$

13. Points W(-12, 8) and Y(16, -13) are endpoints of directed line segment WY. What are the coordinates of point H that partitions WY in the ratio of 4 to 3?
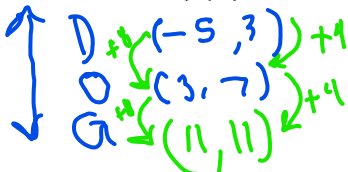
Start + Portion (total) + traveled (distance)

$x: -12 + \frac{4}{7}(28)$    $y: 8 + \frac{4}{7}(-21)$

$X: 4$      $y: -4$

$(4, -4)$

14. Point D(-5, 3) is one end of segment DG. If O(3, 7) is the midpoint of DG, what is point G?

$D \; (-5, 3) \; +9$
$O \; (3, 7) \; +9$
$G \; (11, 11)$

$(11, 11)$

+12

CHALLENGE: If the area of right triangle ABC is 42 square feet. For triangle ABC, A(3, 7), B(10,7), AC is the hypotenuse, and point C(10, y). What are the two possible values of y?

$A_\triangle = \frac{1}{2}bh = 42$ ft$^2$

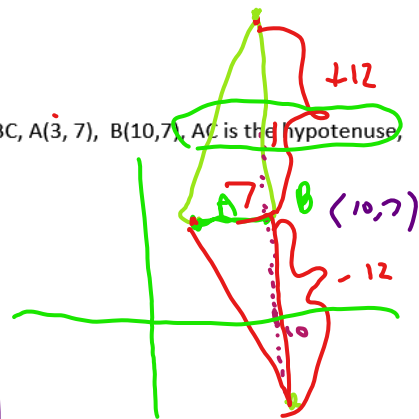$\frac{1}{2}(7)h = 42$

$\frac{3.5h}{3.5} = \frac{42}{3.5}$

$h = 12$

$C\left(10, \overset{7+12}{19}\right)$

$C'\left(10, \overset{7-12}{-5}\right)$

7   B (10,7)

−12

GSE Geometry         Unit 5 – Geometry and the Coordinate Plane         Review

Name: _____ Date: _____

## Coordinate Plane Review

1. Write the equation of the circle centered at (-4, 6) with a diameter of 16.
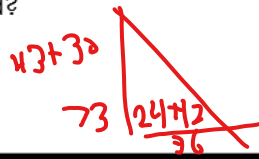
$r = 8$

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

2. Write an equation of the line that passes through (5, -3) and is perpendicular to y = -5/2x+1.

$\perp m = +\frac{2}{5}$

$y = mx + b$

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

Point

3. Reed and Skylar are playing Hide-and-Seek. Reed runs and hides 30 ft south and 24 ft east of base. Skylar runs and hides 43 ft north and 12 ft west of base. How far apart are Skylar and Reed?

$43 + 30$

$73 \quad | 24 + 12 \over 36$

$d = \sqrt{73^2 + 36^2}$
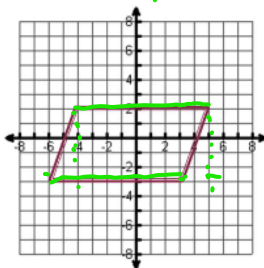
$= \sqrt{6625} \approx 81.4 \text{ ft}$

4. A circular skylight has a diameter with endpoints at (−6, 32) and (2, 26). Find the center and radius of the skylight.

midpoint

distance of center and endpoint

$\left( \frac{-6+2}{2} = -2, \quad \frac{32+26}{2} = 29 \right)$

center $(-2, 29)$

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

$= \sqrt{16 + 9}$

$= \sqrt{25}$

5. Find the perimeter of the figure.

GSE Geometry             Unit 5 – Geometry and the Coordinate Plane             Review

6. Find a point T on the segment with endpoints C(-4, -6) and D(2, 3) that partitions it in a 2:1 ratio.

7. Find the intersection of the circle and line algebraically.

$$x^2 + y^2 = 100$$
$$x - y = 2$$

*[handwritten work]*
$$x^2 + (x-2)^2 = 100$$
$$(x-2)(x-2)$$
$$x^2 + x^2 - 4x + 4 = 100$$
$$2x^2 - 4x - 96 = 0$$
$$x - 2x - 4 = 0$$
$$(x-8)(x+6) = 0$$
$$x = 8 \qquad x = -6 - 8$$

$$-x \quad -x$$
$$-y = -x + 2$$
$$y = x - 2$$

8. Put the equation of the circle in standard form. $x^2 + y^2 - 6x - 2y + 1 = 0$

9. Put the equation of the circle in general form. $(x-2)^2 + (y+3)^2 = 16$

10. Circle C has a center of (5, 2) and a radius of 6. Does the point (8, 7) lie on circle C?