

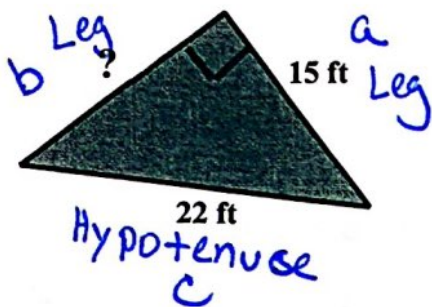
Module 6 Test Review Sheet

*Know all bold/underlined theorems & formulas

1. What is Pythagorean Theorem? Explain each part of this theorem.

The Pythagorean Theorem is used to find the side lengths of Right Triangles. $a^2 + b^2 = c^2$
 Leg² + Leg² = Hypotenuse²

2. Find the missing side of the right triangle to the nearest hundredth.



$$a^2 + b^2 = c^2$$

$$15^2 + b^2 = 22^2$$

$$225 + b^2 = 484$$

$$\begin{array}{r} -225 \\ \hline b^2 = 259 \end{array}$$

$$\sqrt{b^2} = \sqrt{259}$$

$b = \sqrt{259}$ or 16.09 ft.

3. What is the Distance Formula? Explain each part of this formula.

Distance formula is derived from the Pythagorean Theorem. Although we can use the Pythagorean Th. to calculate distance on a graph, the distance formula works well with large numbers.

4. Find the distance between the following coordinates: (37, 27) & (-8, -33)

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

$$D = \sqrt{(37 - (-8))^2 + (27 - (-33))^2}$$

$$D = \sqrt{(45)^2 + (60)^2}$$

$$D = \sqrt{5625}$$

$D = 75$

works well with large numbers:
 $D = \sqrt{(\text{Horizontal Leg})^2 + (\text{Vertical Leg})^2}$
 $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

5. What do you know about the slopes of lines that are parallel?

Parallel lines have congruent slopes (slopes are same)

6. What do you know about the slopes of lines that are perpendicular?

Perpendicular Lines have Opposite Reciprocal Slopes

7. Write the slope-intercept form of a line that passes through the point (-8, 4) and is perpendicular the line $y = 4x - 12$.

$m = \frac{4}{1}$
 $\perp m = -\frac{1}{4}$

Use Point-Slope Form & rewrite it into slope-int. Form

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

$$y - 4 = -\frac{1}{4}(x + 8)$$

$$y - 4 = -\frac{1}{4}x - 2$$

$$\begin{array}{r} +4 \\ \hline y = -\frac{1}{4}x + 2 \end{array}$$

8. Use the **Midpoint Formula** to find the midpoint of the line segment between:

$$MP = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \quad (-1, -1) \text{ \& } (-5, -5)$$

(Average, Average)

$$MP = \left(\frac{-1 + -5}{2}, \frac{-1 + -5}{2} \right) = \left(\frac{-6}{2}, \frac{-6}{2} \right) = (-3, -3)$$

9. Find the other endpoint of the line segment with the given endpoint and midpoint:

Endpoint: $(5, 2)$, Midpoint: $(-10, -2)$

X-value of Midpoint = $\frac{x_1 + x_2}{2}$ y-value of Midpoint = $\frac{y_1 + y_2}{2}$

$$2(-10) = \frac{5 + x}{2}$$

$$-20 = 5 + x$$

$$-25 = x$$

$$2(-2) = \frac{2 + y}{2}$$

$$-4 = 2 + y$$

$$-6 = y$$

Midpoint is $(-25, -6)$ ☺

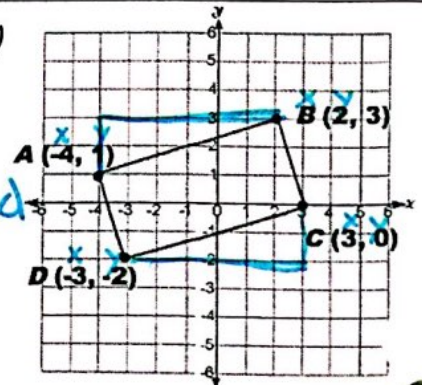
10. Calculate the length, and slope of each side of the quadrilateral below. **SHOW WORK!!!**

	AB	BC	CD	DA
Length: Use Distance formula or Pythagorean Theorem ☺	$D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ $= \sqrt{(-4 - 2)^2 + (1 - 3)^2}$ $= \sqrt{(-6)^2 + (-2)^2}$ $= \sqrt{36 + 4}$ $= \sqrt{40}$	$D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ $= \sqrt{(2 - 3)^2 + (3 - 0)^2}$ $= \sqrt{(-1)^2 + (3)^2}$ $= \sqrt{1 + 9}$ $= \sqrt{10}$	$D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ $= \sqrt{(-3 - 3)^2 + (-2 - 0)^2}$ $= \sqrt{(-6)^2 + (-2)^2}$ $= \sqrt{36 + 4}$ $= \sqrt{40}$	$D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ $= \sqrt{(-3 - (-4))^2 + (-2 - 1)^2}$ $= \sqrt{(1)^2 + (-3)^2}$ $= \sqrt{1 + 9}$ $= \sqrt{10}$
Slope: $\frac{\text{rise}}{\text{run}}$	$\frac{2}{6} = \frac{1}{3}$	$\frac{3}{-1} = -3$	$\frac{-2}{-6} = \frac{1}{3}$	$\frac{-3}{1} = -3$

Use your work to **justify** the type of quadrilateral (Use complete sentences!)

The quadrilateral above is a Rectangle ☺ because...

- opposite sides are parallel $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \parallel \overline{BC}$
- opposite sides are same length $\overline{AB} = \overline{DC}$ and $\overline{BC} = \overline{AD}$



- There are four right angles because the slopes of adjacent lines (intersecting lines) are opposite reciprocals ☺