

Pop Quiz.
Get out a scrap sheet of paper.

1. What is slope-intercept form?

2. What is standard form?

3. What is point-slope form?

Bellwork

10/05/2011

1. Write an equation of the line that passes through the point $(4, -2)$ and has slope 3.

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

$$y + (+2) = 3(x - 4) \quad y = 3x - 14$$

$$y + 2 = 3x - 12$$

$$\begin{array}{r} y + 2 \\ -2 \end{array} = \begin{array}{r} 3x - 12 \\ -12 \end{array}$$

2. Write an equation of the line that passes through the point $(7, 1)$ and is parallel to the line with equation $y = 4$.

x y

$$y = 1$$

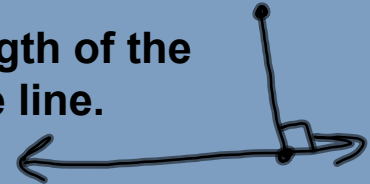
Geometry

3.6 Prove Theorems About Perpendicular Lines

Standard(s): 3,7

Vocabulary:

1. **Distance From a Point to a Line:** The length of the perpendicular segment from the point to the line.



NOTE: This perpendicular segment is the shortest distance between the point and the line.

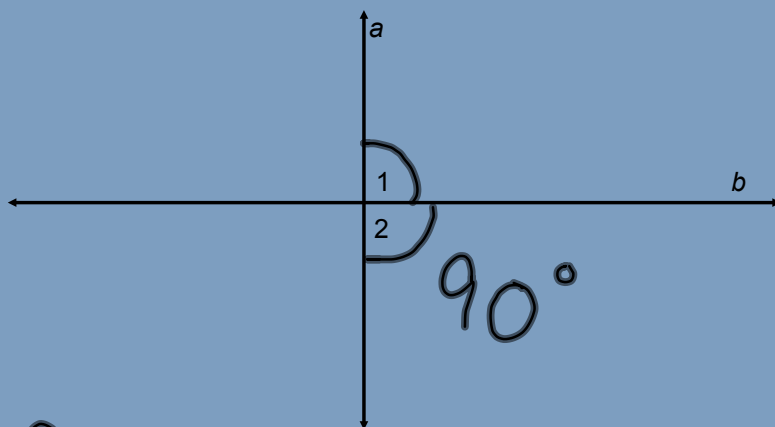
| THEOREMS | For Your Notebook |
|---|-------------------|
| <p>THEOREM 3.8 Linear Pair Theorem</p> <p>If two lines intersect to form a linear pair of congruent angles, then the lines are perpendicular.</p> <p>If $\angle 1 \cong \angle 2$, then $g \perp h$.</p> <p><i>Proof:</i> Ex. 31, p. 196</p> | |
| <p>THEOREM 3.9</p> <p>If two lines are perpendicular, then they intersect to form four right angles.</p> <p>If $a \perp b$, then $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$ are right angles.</p> <p><i>Proof:</i> Ex. 32, p. 196</p> | |

NOTE: Don't get this confused with the definition of linear pairs!

| THEOREM | For Your Notebook |
|---|-------------------|
| <p>THEOREM 3.10</p> <p>If two sides of two adjacent acute angles are perpendicular, then the angles are complementary.</p> <p>If $\overline{BA} \perp \overline{BC}$, then $\angle 1$ and $\angle 2$ are complementary.</p> <p><i>Proof:</i> Example 2, below</p> | |

Draw Conclusions

In the figure, $\angle 1$ and $\angle 2$ are congruent. What can you conclude about $m\angle 2$?

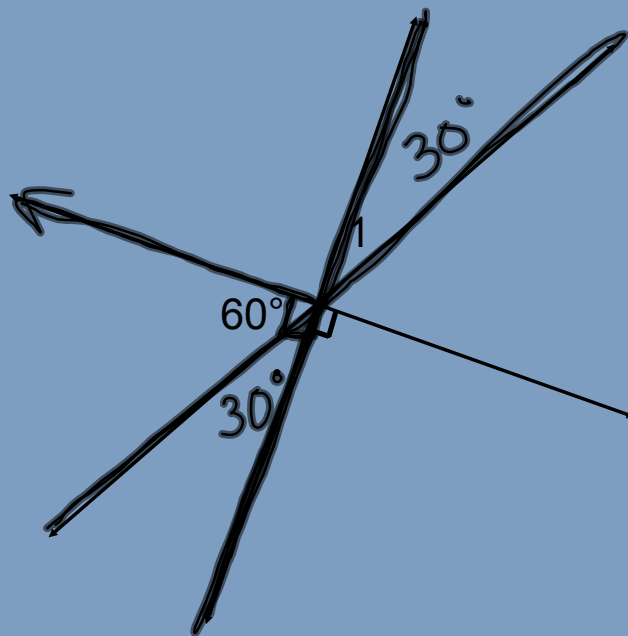


$$m\angle 2 = 90^\circ$$

$\angle 2$ is a right \sphericalangle

Find Missing Angle Measures

Find $m\angle 1$.



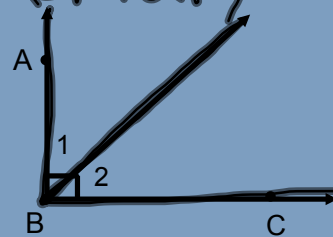
$$m\angle 1 = 30^\circ$$

Prove Theorem 3.10

Prove that if $\angle 1$ and $\angle 2$ are complementary, then $\overrightarrow{BA} \perp \overrightarrow{BC}$.

Given: $\angle 1$ & $\angle 2$ are complementary

Prove: $\overrightarrow{BA} \perp \overrightarrow{BC}$



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. $\angle 1$ & $\angle 2$ are comp. 2. $m\angle 1 + m\angle 2 = 90^\circ$ 3. $m\angle 1 + m\angle 2 = m\angle ABC$ 4. $m\angle ABC = 90^\circ$ 5. $\angle ABC$ is a right \angle 6. $\overrightarrow{BA} \perp \overrightarrow{BC}$ | <ol style="list-style-type: none"> 1. Given 2. Def. of comp. \angle's 3. \angle Addition Post. 4. Substitution Prop. of $=$ 5. Def. of a right \angle 6. Def. of \perp lines |
|---|---|

Draw Conclusions

Use the diagram to answer the questions.

Is $r \parallel s$?

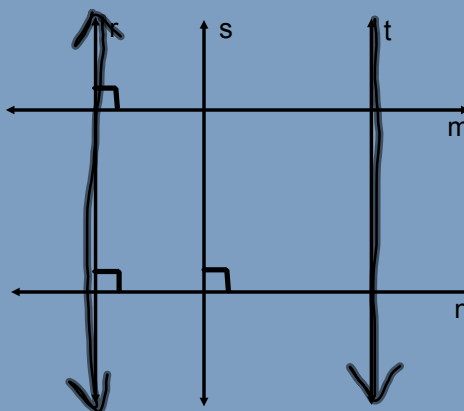
Yes

Is $m \parallel n$?

Yes

Is $r \parallel t$?

No



Find Distance

Find the distance from point A to line c.

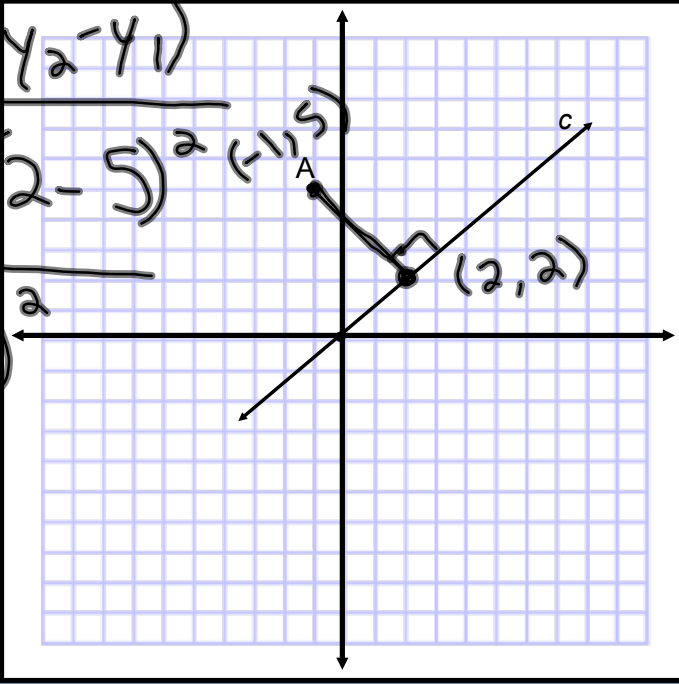
$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(2 - (-1))^2 + (2 - 5)^2}$$

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

$$\sqrt{9 + 9}$$

$$\sqrt{18}$$

$$3\sqrt{2} \approx 4.2$$


Homework Assignment

Worksheet 3.6B

