Activities/ Resources for Unit VII: Algebra & Geometry II
### Lines, Angles and Triangles

**Keep in mind...**  
If at first you succeed, try something harder.

**Lines and Angles**

A pair of points determines at least 4 geometric figures.

- a line \( \overrightarrow{XY} \) or \( \overrightarrow{YX} \)
- a segment \( XY \) or \( YX \)
- a ray \( \overrightarrow{XY} \)
- the ray opposite \( XY \)  

To name the ray with a symbol an additional point is required.

#### Identify the following using symbols.

1. \( \overrightarrow{AB} \)
2. \( \overrightarrow{CD} \)
3. \( \overrightarrow{EF} \)
4. \( \overline{GH} \)
5. \( \overrightarrow{IJ} \)
6. \( \overrightarrow{KL} \)
7. \( \overrightarrow{AT} \)
8. \( \overrightarrow{KV} \)
9. \( \overrightarrow{TV} \)

#### Betweenness

If A, B, C are distinct points on a line then

- A is between B and C, \( B \rightarrow A \rightarrow C \)
- or B is between A and C, \( A \rightarrow B \rightarrow C \)
- or C is between A and B, \( A \rightarrow C \rightarrow B \)

10. Choose the appropriate symbols, (\( \rightarrow \), \( \leftrightharpoons \) or \( \leftrightarrow \)) to make this statement true. LB contains points M and V, but LB contains neither M nor V. V belongs to LB but M does not. ML + LV = MV

11. Make a sketch showing the position of the four points in number 10.
12. Is M between L and B?
13. Is L between M and B?
14. Is V between L and B?
Included Sides and Angles

Side LB is included by $\angle L$ and $\angle B$, the angles whose vertices are the endpoints of the segment. $\angle B$ is included by $\overline{BS}$ and $\overline{BS}$, the segments which form the sides of the angle. $\angle B$ lies opposite $\overline{LS}$, $\overline{BS}$ lies opposite $\angle L$.

1. The side opposite $\angle P$ is _____.
2. The angle included by $\overline{AP}$ and $\overline{LA}$ is _____.
3. The side included by $\angle P$ and $\angle L$ is _____.
4. The side included by $\angle A$ and $\angle ARB$ is _____.
5. The angles opposite $\overline{BR}$ are ____ and ____.  
6. The angle included by $\overline{RB}$ and $\overline{KB}$ is _____.
7. The side opposite $\angle KRB$ is _____.

8. In $\triangle BET$, the side opposite $\angle E$ is _____.
9. In $\triangle SAT$, the angle included by $\overline{AT}$ and $\overline{TS}$ is _____.
10. The segment included by $\angle A$ and $\angle STA$ is _____.

11. The side opposite $\angle MTH$ is _____.
12. The side included by $\angle AHT$ and $\angle HAT$ is _____.
13. The angle included by $\overline{AX}$ and $\overline{TX}$ is _____.
14. The angles opposite $\overline{AT}$ are ____ ____ and ____.  #11-16
15. In $\triangle AXM$, the side opposite $\angle M$ is _____.
16. The segment included by $\angle MXH$ and $\angle MHX$ is _____.
Graphing Inequalities on a Number Line

Graph on a number line.

1) $x > 2$

2) $x \leq -1$

3) $3 > x$

4) $-4 \leq x$

5) $-2 < x < 3$

6) $-3 \leq x \leq 1$

7) $0 \leq x < 4$

Solve for the variable and graph the solution on a number line.

8) $5x + 5 < 3x + 9$

9) $\frac{2}{3}(4x + 1) \geq x - 6$

10) $2x > 5x - 6$

11) $-2(x + 1) \leq 5x - 23$
Answers

1) 

2) 

3) 

4) 

5) 

6) 

7) 

8) $x < 2$

9) $x \geq -4$

10) $x < 2$

11) $x \geq 3$
Pythagorean Theorem

Find the missing length.

1. \( c \)  
   \[ \begin{array}{c} 3 \\ 4 \end{array} \]

2. \( \text{c} \)  
   \[ \begin{array}{c} 5 \\ 12 \end{array} \]

3. \( \text{c} \)  
   \[ \begin{array}{c} 5 \\ 10 \end{array} \]

4. \( \text{c} \)  
   \[ \begin{array}{c} \sqrt{5} \\ 3 \end{array} \]

5. \( \text{c} \)  
   \[ \begin{array}{c} 1 \\ 2 \end{array} \]

6. \( \text{c} \)  
   \[ \begin{array}{c} \sqrt{2} \\ \sqrt{7} \end{array} \]
ANSWERS:

1. 5  
2. 13  
3. $5\sqrt{5}$  
4. $\sqrt{14}$  
5. $\sqrt{5}$  
6. 3  
7. $3\sqrt{5}$  
8. 6  
9. 7  
10. $\sqrt{118}$  
11. $\sqrt{29}$  
12. $\sqrt{13}$