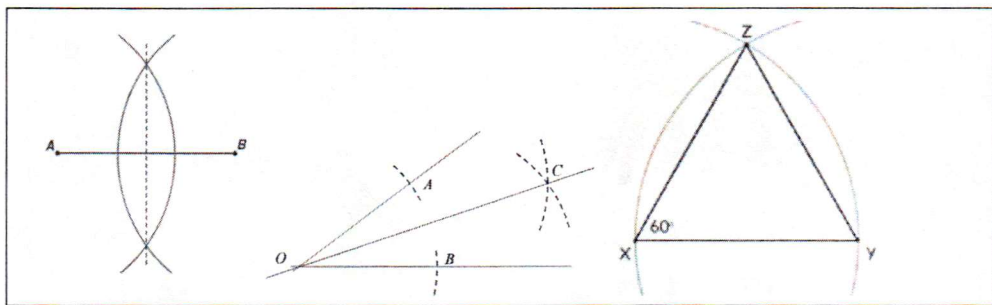


1. Name these constructions:



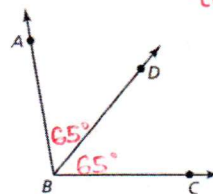
Perpendicular bisector

Angle bisector

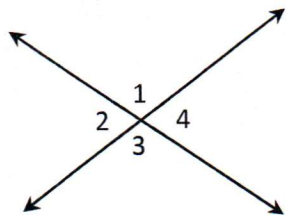
Equilateral triangle

2.  $\overrightarrow{BD}$  bisects  $\angle ABC$ . If  $m\angle ABD = 65^\circ$ , what is the measure of  $\angle ABC$ ?

$65 + 65 = 130^\circ$



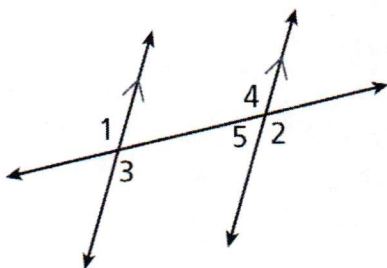
3. In the diagram below,  $m\angle 1 = (4x + 5)^\circ$  and  $m\angle 3 = (2x + 15)^\circ$ . Solve for x.



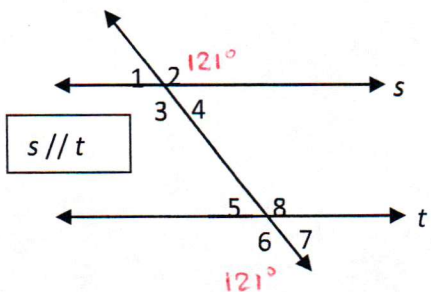
$$\begin{aligned} 4x + 5 &= 2x + 15 \\ -2x &\quad -2x \\ \hline 2x + 5 &= 15 \\ -5 &\quad -5 \\ \hline 2x &= 10 \\ \frac{2x}{2} &= \frac{10}{2} \end{aligned} \quad x = 5$$

4. Name these pairs of angles based on the drawing below:  $\angle 3$  and  $\angle 1$  vertical angles

- $\angle 3$  and  $\angle 5$  consecutive interior angles
- $\angle 4$  and  $\angle 5$  linear pair
- $\angle 3$  and  $\angle 4$  alternate interior angles
- $\angle 1$  and  $\angle 2$  alternate exterior angles
- $\angle 1$  and  $\angle 4$  corresponding angles



5. Based on the drawing below, if  $m\angle 2 = 121^\circ$ , what is  $m\angle 6$ ? what is  $m\angle 5$ ?



$m\angle 6 = 121^\circ$  (alternate exterior)

$$\begin{aligned} 180 \\ -121 \\ \hline 59^\circ \end{aligned}$$

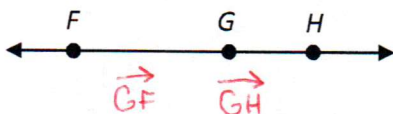
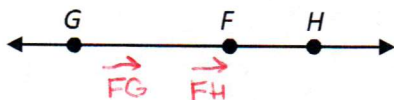
$m\angle 2 = \angle 8$  (corresponding)

$m\angle 5 + \angle 8 = 180$  (linear pair)

$m\angle 5 + 121 = 180$

$m\angle 5 = 59^\circ$

6. Recognize and name opposite rays



7. On a gridded map, position A is at (10, -5) and position B is at (2, 10). Find AB.

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

$$\sqrt{(2-10)^2 + (10-(-5))^2} = \sqrt{-8^2 + 15^2} = \sqrt{64 + 225} = \sqrt{289} = 17$$

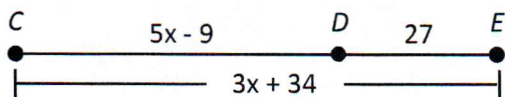
8. Given the lengths of two sides of a triangle, find the range of possible lengths for the third side.

$\frac{19}{32} + \frac{13}{32} = \frac{32}{32}$	$\frac{19}{6} - \frac{13}{6} = \frac{6}{6}$	13 ft and 19 ft	$\frac{45}{25} - \frac{45}{65} = \frac{20}{65}$	$\frac{45}{65} + \frac{45}{25} = \frac{65}{25}$	45 cm and 20 cm	$\frac{32}{7} - \frac{32}{57} = \frac{25}{57}$	$\frac{32}{57} + \frac{32}{25} = \frac{57}{25}$	25 in and 32 in	17 in and 12 in	$\frac{17}{5} - \frac{12}{29} = \frac{12}{29}$	$\frac{17}{5} + \frac{12}{29} = \frac{29}{29}$
		$6 < x < 32$			$25 < x < 65$			$7 < x < 57$	$5 < x < 29$		

9. Solve and justify the equation:  $3(x - 7) - 14 = 2(3x + 8)$

$3x - 21 - 14 = 6x + 16$	1. Dist. Prop
$3x - 35 = 6x + 16$	<del>2. Subtr. prop</del> Simplify
$3x - 35 - 3x = 6x + 16 - 3x$	2. Subtr. prop
$-35 = 3x + 16$	Simplify
$-35 - 16 = 3x + 16 - 16$	3. Subtr. prop
$-51 = 3x$	Simplify
$-17 = x$	4. Div. prop

10. Use the figure below to solve for x.



$$5x - 9 + 27 = 3x + 34$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$5x + 18 = 3x + 34$$

$$-3x \quad -3x$$

$$2x + 18 = 34$$

$$-18 \quad -18$$

$$x = 8$$

11. What is the next term in the sequence?  $\frac{1}{3}, \frac{1}{6}, \frac{1}{9}, \dots$   $\frac{1}{12}$

12. Consider the sequence below: 9, 7, 5, 3, ...

a) Find the next term in the sequence.

13. What is the contrapositive of the statement below?

If an angle is obtuse, then it measures between  $90^\circ$  and  $180^\circ$ .

If the measure is not between  $90^\circ$  and  $180^\circ$ , then it is not an obtuse angle.

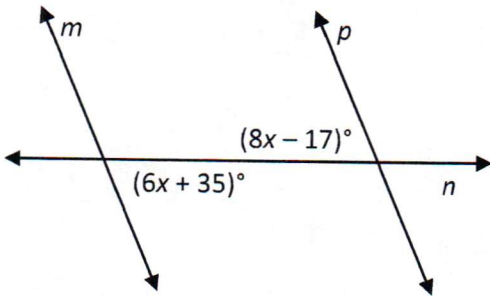
**Obj. 8 – Deductive Reasoning**

14. The statements below are out of order.

- W: If mot, then det.     1<sup>st</sup>    Y
- X: If blitz, then kerd.   2<sup>nd</sup>    X
- Y: If toc, then blitz.    3<sup>rd</sup>    Z
- Z: If kerd, then mot.     4<sup>th</sup>    W

Put the statements in a logical order.

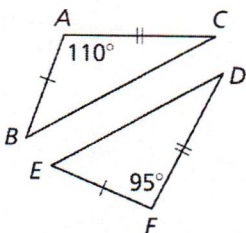
15. Line  $n$  intersects line  $m$  and  $p$ , forming the angles shown in the diagram below. Which value of  $x$  would prove  $m \parallel p$ ?



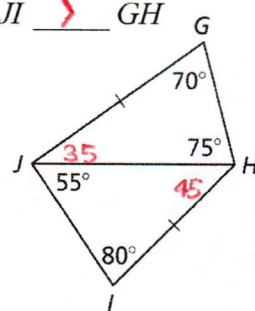
$$\begin{aligned}
 8x - 17 &= 6x + 35 \\
 -6x &\quad -6x \\
 \hline
 2x - 17 &= 35 \\
 +17 &\quad +17 \\
 \hline
 2x &= 52 \\
 \frac{2x}{2} &\quad \frac{52}{2} \\
 \hline
 x &= 26
 \end{aligned}$$

Copy and complete the statement with  $<$ ,  $>$ , or  $=$ . Explain your reasoning.

16.  $BC$   $>$   $DE$



17.  $JI$   $>$   $GH$



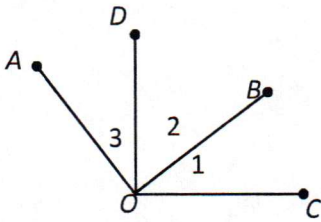
$$\begin{aligned}
 180 \\
 - 70 \\
 - 80 \\
 \hline
 45
 \end{aligned}$$

$$\begin{aligned}
 180 \\
 - 70 \\
 \hline
 75
 \end{aligned}$$

18. Complete the proof:

Given:  $\angle AOB$  and  $\angle DOC$  are right angles

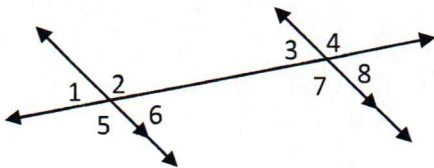
Prove:  $\angle 3 \cong \angle 1$



Statements	Reasons
1. $\angle AOB$ & $\angle DOC$ rt. $\angle$ s	1. <i>Given</i>
2. $m\angle AOB = 90^\circ$ , $m\angle DOC = 90^\circ$	2. Def. right $\angle$ s
3. $m\angle 3 + m\angle 2 = m\angle AOB$	3. Angle Add. Post.
4. $m\angle 2 + m\angle 1 = m\angle DOC$	4.
5. $m\angle 3 + m\angle 2 = 90^\circ$ , $m\angle 2 + m\angle 1 = 90^\circ$	5.
6. $m\angle 3 + m\angle 2 = m\angle 2 + m\angle 1$	6. Subst. prop. =
7. $m\angle 3 = m\angle 1$	7.
8. $\angle 3 \cong \angle 1$	8. Def. $\cong \angle$ s

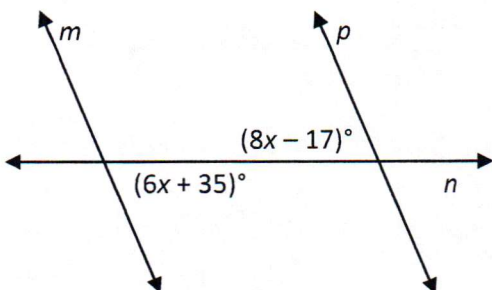
*Skip*

19. In the accompanying figure, what is one pair of alternate interior angles?



*$\angle 2$  and  $\angle 7$   
or  
 $\angle 6$  and  $\angle 3$*

20. Line  $n$  intersects line  $m$  and  $p$ , forming the angles shown in the diagram below. Which value of  $x$  would prove  $m \parallel p$ ?



$$\begin{aligned}
 8x - 17 &= 6x + 35 \\
 -6x &\quad -6x \\
 2x - 17 &= 35 \\
 +17 &\quad +17 \\
 2x &= 52 \\
 x &= 26
 \end{aligned}$$

21. If one point is at  $(0, b)$  and another point is at  $(3b, 0)$ , what is the slope of the line between them?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - b}{3b - 0} = \frac{-b}{3b} = -\frac{1}{3}$$

22. Two points whose coordinates are  $(4, 17)$  and  $(2, a)$  determine a line whose slope is 6. Find the value of  $a$ .

$$m = \frac{a - 17}{2 - 4} = 6 \quad \cancel{2} \cdot \frac{a - 17}{\cancel{-2}} = 6 \cdot -2 \quad \begin{array}{l} a - 17 = -12 \\ +17 \quad +17 \\ \hline a = 5 \end{array}$$

23. What is the slope of the line whose equation is  $5x - 4y = 10$ ?

$$\begin{array}{l} 5x - 4y = 10 \\ -5x \quad -5x \end{array} \quad \begin{array}{l} -4y = -5x + 10 \\ -4 \quad -4 \end{array} \quad y = \frac{5}{4}x - \frac{5}{2} \quad m = \frac{5}{4}$$

24. Which is an equation of the line that passes through the point  $(7, -3)$  and has a slope of  $-2$ ?

$$y = mx + b \quad \begin{array}{l} -3 = -2(7) + b \\ -3 = -14 + b \\ +14 \quad +14 \\ \hline b = 11 \end{array} \quad y = -2x + 11$$

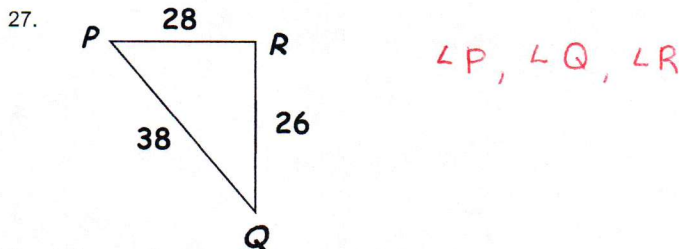
25. Write the equation of a line that is parallel to the line whose equation is  $y = \frac{2}{3}x + 1$  and goes through the point  $(3, 1)$ .

$$m = \frac{2}{3} \quad \begin{array}{l} 1 = \frac{2}{3}(3) + b \\ 1 = 2 + b \\ -2 \quad -2 \\ \hline -1 = b \end{array} \quad y = \frac{2}{3}x - 1$$

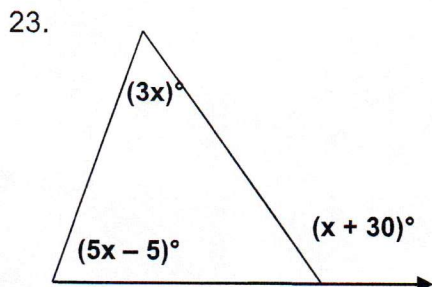
26. Which is an equation of a line perpendicular to the line whose equation is  $y = -3x + 7$ ?

- A)  $y = 3x - 1$       B)  $y = -3x - 1$        $m = -3$   
 C)  $y = \frac{1}{3}x - 1$       D)  $y = -\frac{1}{3}x - 1$       perp  $m = \frac{1}{3}$

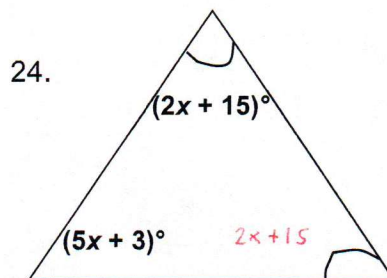
List the angles in order from smallest to largest.



Find the values of the variables.



$$\begin{array}{r} 5x - 5 = x + 30 \\ -x \quad -x \\ \hline 4x - 5 = 30 \\ +5 \quad +5 \\ \hline 4x = 35 \\ x = 8.75 \end{array}$$



$$\begin{array}{l} 2x + 15 + 2x + 15 + 5x + 3 = 180 \\ 9x + 33 = 180 \\ -33 \quad -33 \\ \hline 9x = 147 \\ x = 16.3 \end{array}$$

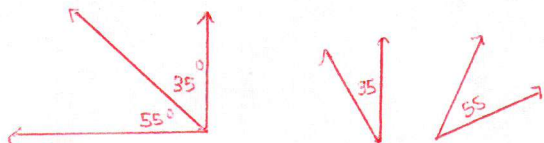
28. Write the following definition as a biconditional:

A triangle is a polygon with three sides.

A triangle is a polygon if and only if it has three sides.

Define each and draw an example:

29. Complementary angles



30. Right angle



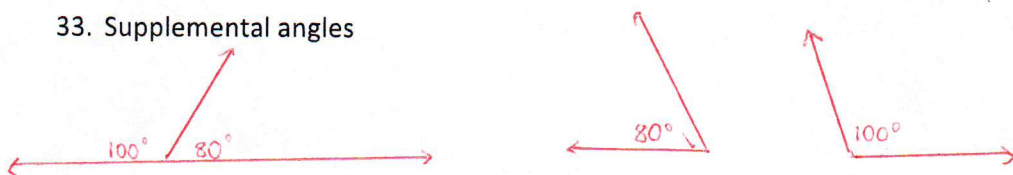
31. Straight Angle



32. Linear Pair



33. Supplemental angles



Is it possible for a triangle to have sides with the given lengths? (Yes or No)

no 32. 7, 9, 17  $7+9=16 > 17$  no

yes 33. 3, 5, 7  $3+5=8$   $5+7=12$   $3+7=10$

no 34. 13, 14, 29  $13+14=27 > 29$  no

no 35. 1.5, 5, 6.75

$$1.5 + 5 = 6.5 > 6.75$$

no