

Name: Key

Date: _____

7R

Classwork 10.2

Angle Relationships Basic

Aim: How can we find unknown angles using angle relationships?

Angle Relationship	Angle Fact	Diagram
	- opposite angles formed by two intersecting lines	
VERTICAL ANGLES	- Vertical angles are <u>congruent</u> . $\angle 1$ and $\angle 3$ are vertical $\angle 1 \cong \angle 3$ $\angle 2$ and $\angle 4$ are vertical $\angle 2 \cong \angle 4$	
COMPLEMENTARY ANGLES	- two or more angles whose measures <u>have a sum of 90°</u> - form a right angle If $\angle 3 = 40^\circ$, $\angle 4$ must be 50°] = 90°	
SUPPLEMENTARY ANGLES	- two or more angles whose measures <u>have a sum of 180°</u> - form a straight angle If $\angle 1 = 100^\circ$, $\angle 2$ must be 80°] = 180°	

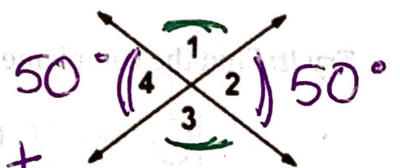
Example 1: Name 2 pairs of vertical angles.

$\angle 4$ & $\angle 2$

$\angle 1$ & $\angle 3$

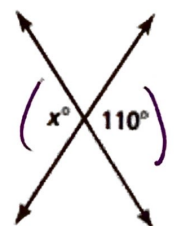
If $m\angle 2 = 50^\circ$, find the $m\angle 4$. 50°

b/c they are vertical \rightarrow congruent



Try It: Find the measure of x and explain how you determined your answer.

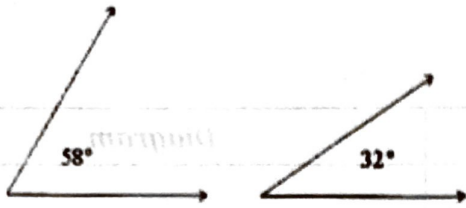
$x = 110^\circ$ b/c vertical angles are congruent



➤ Two angles are called **COMPLEMENTARY ANGLES** if their sum equals 90°

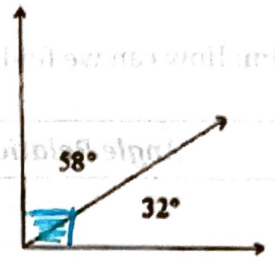
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These two angles are complementary.

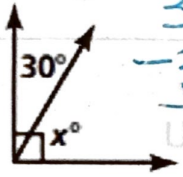


$$58 + 32 = 90^\circ$$

Notice how these two angles can be placed together to form a right angle!



Example 2: Find the measure of the missing angle using the diagram below.



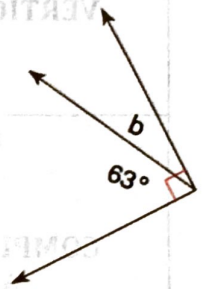
$$\begin{array}{r} 30 + x = 90 \\ -30 \quad -30 \\ \hline \end{array}$$

$$x = 60^\circ$$

Try It: Find the measure of angle b in the diagram below.

$$\begin{array}{r} b + 63 = 90 \\ -63 \quad -63 \\ \hline \end{array}$$

$$b = 27^\circ$$



Example 3: Find the complement of:

a. 45° 45°

$$90 - 45 = 45$$

b. 1° 89°

$$90 - 1 = 89$$

→ looks like complementary

To find the **complement** of an angle, subtract the given angle from

90.

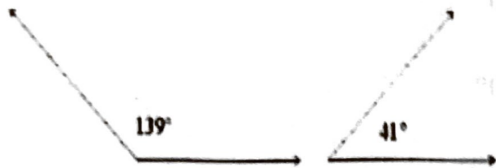
Try It: Find the complement of an angle whose measure is 29°.

$$90 - 29 = \boxed{61^\circ}$$

➤ Two angles are called **SUPPLEMENTARY ANGLES** if their sum equals 180

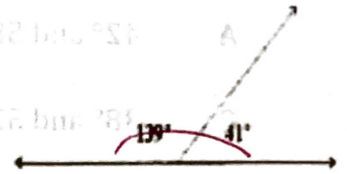
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Example 4: These two angles are supplementary.

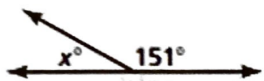


$$139 + 41 = 180$$

Notice how these two angles can be placed together to form a straight line!



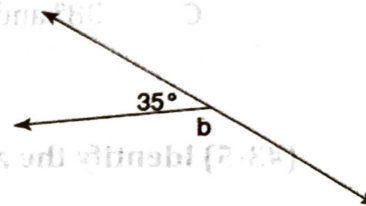
Example 4: Find the measure of the missing angle using the diagram below.



$$\begin{array}{r} x + 151 = 180 \\ -151 \quad -151 \\ \hline \end{array}$$

$$x = 29^\circ$$

Try It: Find the measure of angle b in the diagram below.



$$\begin{array}{r} 35 + b = 180 \\ -35 \quad -35 \\ \hline \end{array}$$

$$b = 145^\circ$$

looks like supplementary

Example 4: Find the supplement of:

a. 100° 80°

$$180 - 100 = 80$$

b. 44° 136°

$$180 - 44 = 136$$

To find the **supplement** of an angle, subtract the given angle from

180.

Try It: If an angle measures 115° , what is the measure of its supplement?

$$180 - 115 = \boxed{65^\circ}$$