

Lesson 12.2:

Complementary and Supplementary Angles

Essential Question

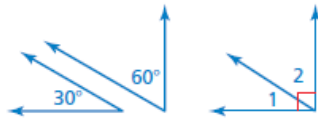
How can you classify two angles as complementary or supplementary?

Key Ideas

Complementary Angles

Words Two angles are **complementary angles** when the sum of their measures is 90° .

Examples



$\angle 1$ and $\angle 2$ are complementary angles.

90°

Giving a **complement** is the **right** thing to do

Supplementary Angles

Words Two angles are **supplementary angles** when the sum of their measures is 180° .

Examples



$\angle 3$ and $\angle 4$ are supplementary angles.

180°

Supplements are extra

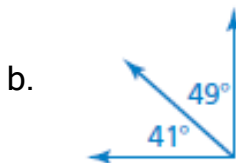
C 90° **CC** \rightarrow **C**
 $90^\circ + 90^\circ \rightarrow 180^\circ$

Tell whether the angles are complementary, supplementary, or neither.



$70^\circ + 110^\circ = 180^\circ$

Supplementary



$41^\circ + 49^\circ = 90^\circ$

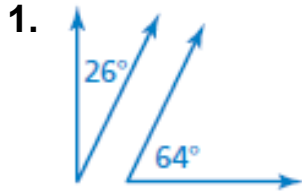
Complementary



$128^\circ + 62^\circ = 190^\circ$

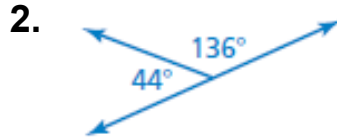
Neither

Tell whether the angles are *complementary*, *supplementary*, or *neither*.



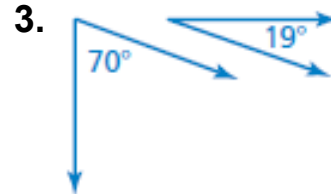
$$26^\circ + 64^\circ = 90^\circ$$

Complementary



$$44^\circ + 136^\circ = 180^\circ$$

Supplementary

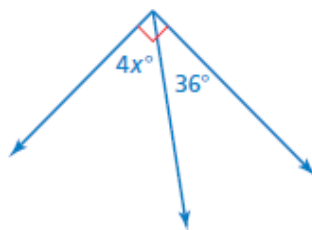


$$70^\circ + 19^\circ = 89^\circ$$

Neither

Tell whether the angles are complementary or supplementary.
Then find the value of x .

a.

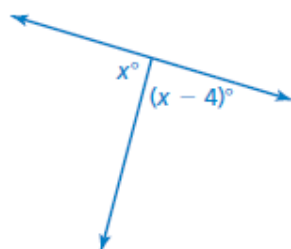


$$4x + 36 = 90$$

$$4x = 54$$

$$x = 13.5$$

b.

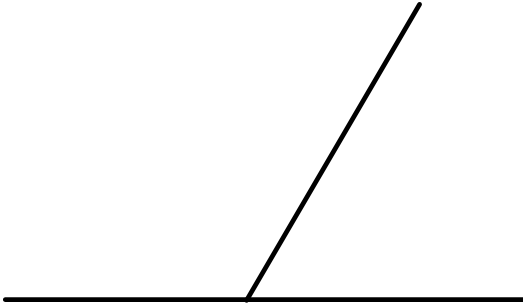


$$x + x - 4 = 180$$

$$2x = 184$$

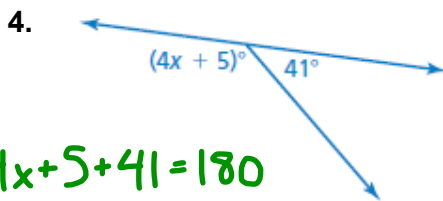
$$x = 92$$

Draw a pair of adjacent supplementary angles so that one angle has a measure of 60° .



Supplementary angles are 180° , so draw a straight line and then make a 60° angle on that line.

Tell whether the angles are **complementary** or **supplementary**. Then find the value of x .

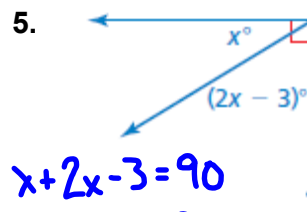


$$4x + 5 + 41 = 180$$

$$4x + 46 = 180$$

$$4x = 134$$

$$x = 33.5$$

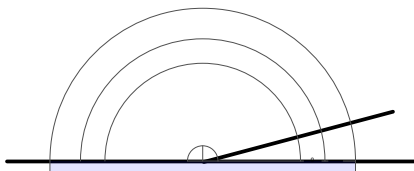


$$x + 2x - 3 = 90$$

$$3x = 93$$

$$x = 31$$

6. Draw a pair of adjacent supplementary angles so that one angle has a measure of 15° .



Tell whether the statement is *always*, *sometimes*, or *never* true. Explain.

1. If x and y are supplementary angles, then x is right.

S

2. If x and y are complementary angles, then y is acute.

A

3. If x is a right angle and y is an acute angle, then x and y are supplementary angles.

N

4. If x is acute and y is obtuse, then x and y are supplementary angles.

S