

Name

1/25/12

Algebra Readiness 6

Period #

Outcome: Investigate angle relationships.

Worksheet: Skill 6 Angle Relationships (Vertical, Complimentary, Supplementary)

1. Vertical angles; $m\angle x = 16^\circ$

2. Complementary angles; $m\angle x = 28^\circ$

$$x + 62 = 90$$

$$\begin{array}{r} -62 \\ -62 \end{array}$$

$$x = 28$$

$$28 + 62 = 90$$

$$90 = 90$$

3. Supplementary angles; $m\angle x = 153^\circ$

$$x + 27 = 180$$

$$\begin{array}{r} -27 \\ -27 \end{array}$$

$$x = 153$$

$$153 + 27 = 180$$

$$180 = 180$$

4. Complementary angles; $m\angle x = 47^\circ$

$$x + 43 = 90$$

$$\begin{array}{r} -43 \\ -43 \end{array}$$

$$x = 47$$

$$47 + 43 = 90$$

$$90 = 90$$

5. Supplementary angles; $m\angle x = 59^\circ$

$$x + 121 = 180$$

$$\begin{array}{r} -121 \\ -121 \end{array}$$

$$x = 59$$

$$59 + 121 = 180$$

$$180 = 180$$

6. Vertical angles; $m\angle x = 90^\circ$

7. $A = B$

$$63 = x + 15$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$48 = x$$

$$m \angle x = 48^\circ$$

$$63 = 48 + 15$$

$$63 = 63$$

8. $P + Q = 180$

$$(x - 25) + 102 = 180$$

$$\begin{array}{r} -102 \\ -102 \end{array}$$

$$x - 25 = 78$$

$$\begin{array}{r} +25 \\ +25 \end{array}$$

$$x = 103$$

$$m \angle x = 103^\circ$$

$$(103 - 25) + 102 = 180$$

$$78 + 102 = 180$$

$$180 = 180$$

9. $Y + Z = 90$

$$(4x + 2) + (5x - 2) = 90$$

$$9x + 2 - 2 = 90$$

$$9x = 90$$

$$\begin{array}{r} \div 9 \\ \div 9 \end{array}$$

$$x = 10$$

$$m \angle x = 10^\circ$$

$$(4(10) + 2) + (5(10) - 2) = 90$$

$$(40 + 2) + (50 - 2) = 90$$

$$42 + 48 = 90$$

$$90 = 90$$

Homework: #10-11

SKILL
6

Name _____ Date _____

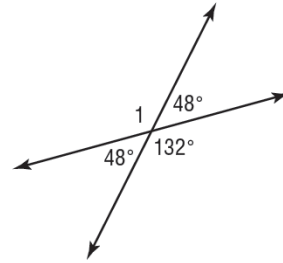
Angle Relationships

When two lines intersect, they form two pairs of opposite angles called vertical angles. Vertical angles have the same measure and are therefore congruent.

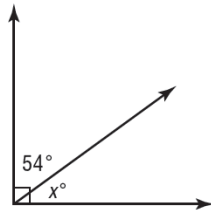
EXAMPLE Find $m\angle 1$.

Angle 1 and the angle whose measure is 132° are vertical angles. Therefore, they are congruent.

Thus, $m\angle 1 = 132^\circ$.

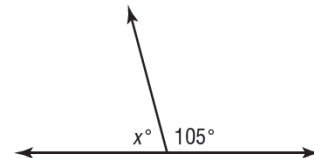


Two angles are **complementary** if the sum of their measures is 90° .
Two angles are **supplementary** if the sum of their measures is 180° .

EXAMPLES Find x in each figure.

The two angles form a right angle, which measures 90° . Therefore, the angles are complementary.

$$\begin{aligned} 54 + x &= 90 \\ 54 + x - 54 &= 90 - 54 \\ x &= 36 \end{aligned}$$

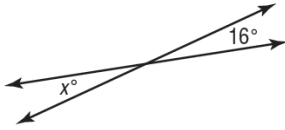


The two angles form a straight line, which measures 180° . Therefore, the angles are supplementary.

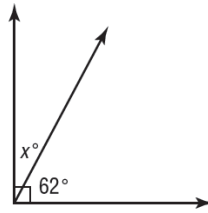
$$\begin{aligned} x + 105 &= 180 \\ x + 105 - 105 &= 180 - 105 \\ x &= 75 \end{aligned}$$

EXERCISES Find the value of x in each figure.

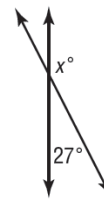
1.



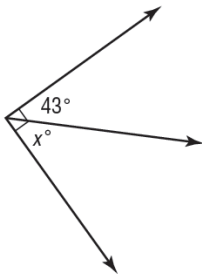
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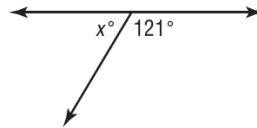
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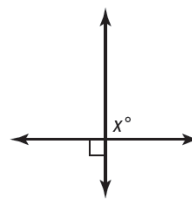
4.



5.



6.



7. Angles A and B are vertical angles. If $m\angle A = 63^\circ$ and $m\angle B = (x + 15)^\circ$, find the value of x .
8. Angles P and Q are supplementary angles. If $m\angle P = (x - 25)^\circ$ and $m\angle Q = 102^\circ$, find the value of x .
9. Angles Y and Z are complementary. If $m\angle Y = (4x + 2)^\circ$ and $m\angle Z = (5x - 2)^\circ$, find the value of x .

APPLICATIONS

10. A carpenter uses a power saw to cut a piece of lumber at a 135° angle. What is the measure of the other angle formed by the cut?



11. Megan is making a quilt using the pattern shown at the right.

- a. What is $m\angle 1$?
- b. What is $m\angle 2$?
- c. What is $m\angle 3$?

