

MATH 7 Accelerated: Week of April 13

Go through the slides (notes) and work through the examples on a separate piece of paper. Then do the given practice problems (again, on a separate piece of paper). Check your answers with the key given at the bottom of the practice page. Check Google Classroom for the schedule of online help sessions via Zoom.

Answers to last week's packet can be found on the 2nd page of the Math 7 section in this packet.

Lesson 2

Classifying Angles

Target: Classify angles as acute, right, obtuse or straight.

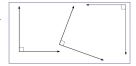
*NOTE: Do not use a protractor for anything in this unit. Angles are not drawn to scale. Instead, you will be using algebraic equations to find missing measurements.

Vocabulary

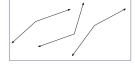
▶ **Acute Angle:** An angle that measures more than 0° and less than 90° .



▶ **Right Angle:** An angle that measures exactly 90° .



▶ **Obtuse Angle:** An angle that measures more than 90° but less than 180° .



▶ **Straight Angle:** An angle that has a measure of 180° .

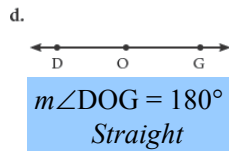
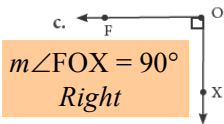
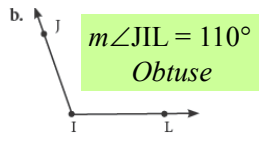
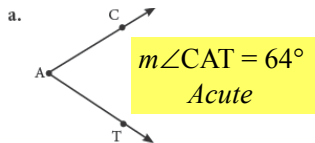


▶ **Congruent:** Equal in measure.

▶ $m\angle ABC$ means "the measure of angle ABC"

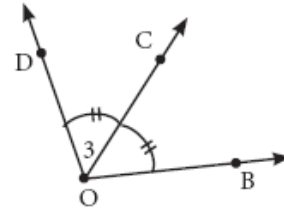
Example 1

Classify each angle.



Example 2

Sketch a diagram of congruent and adjacent angles.



The angles share \overline{OC} which makes them adjacent. The congruence marks indicate the angles are congruent.

Example 3



Use the information in the diagram to write an equation. Solve for x .

Congruence marks show the angles are congruent.

Write the equation.
Add 11 to each side.

Divide by 5 on each side.

$$\begin{aligned} \angle SIM &\cong \angle PLE \\ 5x - 11 &= 39 \\ +11 &+11 \\ \hline 5x &= 50 \\ \frac{5x}{5} &= \frac{50}{5} \\ x &= 10 \end{aligned}$$

Example 4

$\angle JAK$ is congruent to $\angle HIL$. The measure of $\angle JAK = (12 - 3x)^\circ$ and the measure of $\angle HIL = (44 - x)^\circ$. Solve for x . Then find the degree measure of each angle.

$$\begin{aligned} \angle JAK &\cong \angle HIL \\ \text{Write an equation.} & \quad 12 - 3x = 44 - x \\ \text{Add } x \text{ to both sides.} & \quad \begin{array}{r} 12 - 3x = 44 - x \\ +x \quad +x \\ \hline 12 - 2x = 44 \end{array} \\ \text{Subtract 12 from each side.} & \quad \begin{array}{r} 12 - 2x = 44 \\ -12 \quad -12 \\ \hline -2x = 32 \end{array} \\ \text{Divide by } -2 \text{ on each side.} & \quad \begin{array}{r} -2x = 32 \\ -2 \quad -2 \\ \hline x = -16 \end{array} \end{aligned}$$

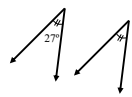

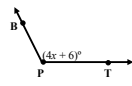
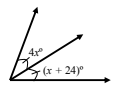
Substitute the solution, -16 , for x to find the degree measure of each angle.

- ▶ $\angle JAK = 12 - 3(-16) = 12 + 48 = 60^\circ$
- ▶ $\angle HIL = 44 - (-16) = 44 + 16 = 60^\circ$

L2 Practice Problems: Sketch a diagram for each description. Label each angle.

1. $\angle WVU$ is a right angle 2. $\angle FAM$ is obtuse
3. two adjacent acute angles

L2 Practice Problems: Set up an equation and solve for x .

4. 
5. 
6. $m\angle BPT = 98^\circ$

7. 

Lesson 3 **Complementary and Supplementary Angles**

Target:
Identify and solve equations using supplementary and complementary angles.

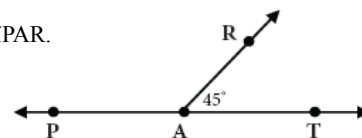
Vocabulary

Complementary Angles: Two angles with a sum of 90° .

Supplementary Angles: Two angles with a sum of 180° .

Example 1

Use the diagram to find $m\angle PAR$.



$m\angle PAR$ and $m\angle TAR$ are supplementary.

Supplementary angles have a sum of 180° .

Subtract 45 from each side.

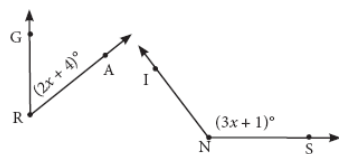
$$\begin{array}{r} m\angle PAR + 45 = 180 \\ -45 \quad -45 \\ \hline m\angle PAR = 135^\circ \end{array}$$

$m\angle PAR = 135^\circ$

Example 2

$\angle GRA$ and $\angle INS$ are supplementary.

- a. Write an equation to solve for x .
b. Determine the measure of each angle.



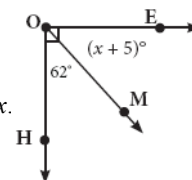
- a. Write an equation.
Combine like terms.
Subtract 5 from each side.
Divide by 5 on each side.

$$\begin{array}{r} (2x + 4) + (3x + 1) = 180 \\ 5x + 5 = 180 \\ -5 \quad -5 \\ \hline 5x = 175 \\ \hline x = 35 \end{array}$$

- b. Substitute 35 for x in each angle measure.
 $m\angle GRA = (2x + 4) = (2(35) + 4) = (70 + 4) = 74^\circ$
 $m\angle INS = (3x + 1) = (3(35) + 1) = (105 + 1) = 106^\circ$
The solution is correct because $74^\circ + 106^\circ = 180^\circ$.

Example 3

Use the diagram to write an equation. Solve for x .



Complementary angles have a sum of 90° .

- Substitute degree measures.
Combine like terms.
Subtract 67 from both sides.

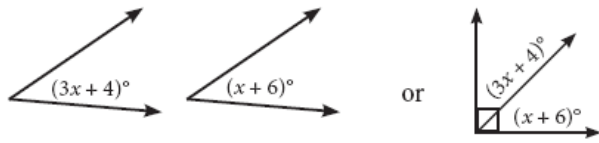
$$\begin{array}{r} \angle HOM + \angle MOE = 90^\circ \\ 62 + (x + 5) = 90 \\ x + 67 = 90 \\ -67 \quad -67 \\ \hline x = 23 \end{array}$$

The value of x is 23.

Example 4a

$\angle 1$ and $\angle 2$ are complementary angles. The measure of $\angle 1 = (3x + 4)^\circ$ and $m\angle 2 = (x + 6)^\circ$.

a. Draw a diagram.



Example 4bc

$\angle 1$ and $\angle 2$ are complementary angles. The measure of $\angle 1 = (3x + 4)^\circ$ and $m\angle 2 = (x + 6)^\circ$.

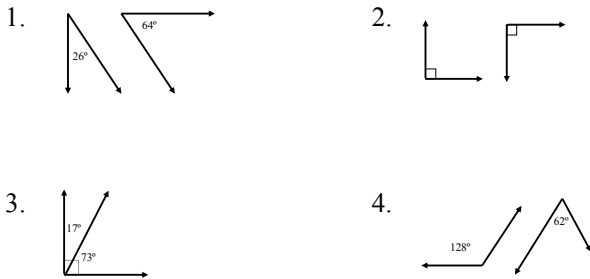
b. Write an equation, and solve for x .
c. Find the two angle measures.

b. Complementary angles have a sum of 90° . $m\angle 1 + m\angle 2 = 180$
 Substitute the degree measures. $(3x + 4) + (x + 6) = 90$
 Combine like terms. $4x + 10 = 90$
 Subtract 10 from each side. $\frac{-10}{4} \quad \frac{-10}{4}$
 $\frac{4x}{4} = \frac{80}{4}$
 $x = 20$

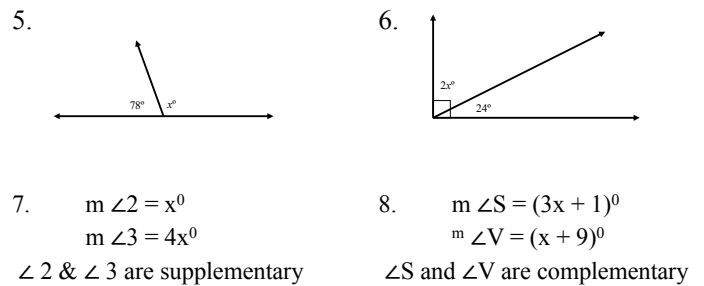
Divide by 4 on both sides.

c. Substitute 20 for x in each degree measure of the angles.
 $m\angle 1 = (3x + 4) = (3(20) + 4) = (60 + 4) = 64^\circ$
 $m\angle 2 = (x + 6) = (20 + 6) = 26^\circ$

L3 Practice Problems: Identify each pair of angles as complementary, supplementary or neither.



L3 Practice Problems: Write an equation for each description. Solve for x .



Practice Problems: ANSWER PAGE

L2:

7. $4x = x + 24, x = 8$
6. $4x + 6 = 98, x = 23$
5. $7x - 1 = 90, x = 13$
4. $3x = 27, x = 9$



L3:

1. Complementary
2. Supplementary
3. Complementary
4. Neither
5. $78 + x = 180, x = 102^\circ$
6. $2x + 24 = 90, x = 33^\circ$
7. $x + 4x = 180, x = m\angle 2 = 36^\circ, m\angle 3 = 144^\circ$
8. $3x + 1 + x + 1 = 90, x = 20, m\angle S = 61^\circ, m\angle V = 29^\circ$

ANSWERS TO LAST WEEK'S PACKET (Problem of the Day)

- 1) 91 pennies
- 2) 89 ways
- 3) 1)8 2)12 3)6 4)1
 $4 \times 4 \times 4 = 8, 24, 24, 8$ $5 \times 5 \times 5 = 8, 36, 54, 27$
- 4) 6, 6, 0
- 5) 15, 55, $\frac{1}{2}(n^2 + n)$
- 6) 5, 13, 26, 45 (+8, +13, +19)
- 7) 1st digit is 1 less than subtracting the first digits. 1st & last digit add to 9; middle digit = 9
- 8) 6, 24, 120. use a factorial: "!" (! means if there are 6 blocks, it is $6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1$)
- 9) They both needed 6 helpers
- 10) A square of 10×10 has the largest area.

MATH 7A: LAST SLIDE for this week!