

9. A linear pair of angles are always adjacent and  
 a) congruent  
 b) complementary  
 c) supplementary  
 d) vertical
10. An angle has a measure of  $38^\circ$ . Its complement has a measure of \_\_\_\_\_, and its supplement has a measure of \_\_\_\_\_.

10.  $52^\circ, 142^\circ$
9. C
8. A
7.  $140^\circ$
- e) Never  
 d) Always  
 c) Always  
 b) Never  
 a) Sometimes
- 6.
5. B
4. A, C or C, A
3. B
2.  $67^\circ$
1. C, E

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# GEOMETRY

## The Complete Course

### Lesson Two

# Angles And Angle Measure

KA8462

## Worksheet

## I. VIDEOTAPE FOLLOW-UP QUESTIONS

- I. Introduction.
- II. Definition of an angle.
  - A. Set of points on the angle
  - B. Set of points inside the angle
  - C. Set of points outside the angle
- III. Parts of an angle.
  - A. Sides
  - B. Vertex
- IV. Naming and angle.
  - A. Using only 1 letter
    1. English letter
    2. Greek letters
  - B. Using three letters
  - C. Using numbers
- V. System of angular measurement.
  - A. Limitations of angular measurement: Given any angle, there is a unique real number between zero and 180 known as its degree measure. (P2-1)
  - B. **Protractor postulate:** In a given plane, select any line  $\overleftrightarrow{AB}$  and any point C between A and B. Also select any two points R and S on the same side of  $\overleftrightarrow{AB}$  such that S is not on  $\overleftrightarrow{CR}$ . Then there is a pairing of rays to real numbers from 0 to 180 as follows.
    1.  $\overrightarrow{CA}$  is paired with 0 and  $\overrightarrow{CB}$  is paired with 180.
    2. If  $\overrightarrow{CR}$  is paired with x, then  $0 < x < 180$ .
    3. If  $\overrightarrow{CR}$  is paired with x and  $\overrightarrow{CS}$  is paired with y, then  $m\angle RCS = |x - y|$ . (P2-2)
  - C. Angle addition postulate: If D is in the interior of ABC, then  $m\angle ABC = m\angle ABD + m\angle DBC$ . (P2-3)
- VI. Classification by their measure.
  - A. Acute angles
  - B. Right angles
  - C. Obtuse angles
  - D. Straight angles
- VII. Related Angles.
  - A. Congruent angles
  - B. Adjacent to angles

- C. Complementary angles
- D. Supplementary angles
- E. Linear pair of angles
- F. Vertical angles

- VIII. Other Postulates Related to Angles and Angle Measure.
  - A. Every angle, except a straight angle, has exactly one bisector. (P2-4)
  - B. If the outer rays of two adjacent angles form a straight angle, then the sum of the measures of the angles is 180. (P2-5)

- IX. Theorems Related to Angles and Angle Measure.
  - A. Angle Bisector Theorem: if  $\overrightarrow{OX}$  is the bisector of  $\angle AOB$ , then:

$$2m\angle AOX = m\angle AOB \quad 2m\angle XOB = m\angle AOB$$

and and

$$m\angle AOX = \frac{1}{2}m\angle AOB \quad m\angle XOB = \frac{1}{2}m\angle AOB$$

(T2-1)

- B. If two angles are right angles, then they are congruent. (T2-2)
- C. If the outer rays of two acute adjacent angles are perpendicular, then the sum of the measures of the angles is 90. (T2-3)
- D. If two lines are perpendicular, then four right angles are formed. (T2-4)
- E. If two lines intersect to form a pair of congruent adjacent angles, then the lines are perpendicular. (T2-5)
- F. If two angles are complements of congruent angles, then they are congruent. (Complements of congruent angles are congruent.) (T2-6)
- G. If two angles are complements of the same angle, then they are congruent. (Complements of same angles are congruent.) (T2-7)
- H. If two angles are supplements of congruent angles, then they are congruent. (Supplements of congruent angles are congruent.) (T2-8)
- I. If two angles are supplements of the same angle, then they are congruent. (Supplements of the same angle are congruent.) (T2-9)
- J. Vertical angles are congruent. (T2-10)

## II. SUPPLEMENTARY EXERCISES

1. In triangle XYZ, angle X can also be named:
  - a) angle YZ
  - b) angle XYZ
  - c) angle YXZ
  - d) angle ZYX
  - e) angle ZXY
2. If point M is in the interior of  $\angle CAT$  and  $m\angle CAM = 25^\circ$  and  $m\angle TAM = 42^\circ$ , then what is the measure of  $\angle CAT$ ?
3. Two consecutive edges of a door form a(n):
  - a) acute angle
  - b) right angle
  - c) obtuse angle
  - d) straight angle
4. If two intersecting lines are not perpendicular, then one pair of vertical angles are \_\_\_\_\_ and the other pair of vertical angles are \_\_\_\_\_.
  - a) acute
  - b) right
  - c) obtuse
  - d) straight
5. If the measure of one angle is  $30^\circ$  and the measure of another angle is  $60^\circ$ ; then the pair of angles are said to be
  - a) congruent
  - b) complementary
  - c) supplementary
  - d) linear pair
  - e) vertical
6. Answer each case with the words "never", "sometimes", or "always". If two lines intersect, any two adjacent angles would be:
  - a) congruent angles \_\_\_\_\_
  - b) complementary angles \_\_\_\_\_
  - c) supplementary angles \_\_\_\_\_
  - d) linear pair of angles \_\_\_\_\_
  - e) vertical angles \_\_\_\_\_
7. If  $\overrightarrow{SC}$  is the bisector of  $\angle USA$  and in  $\angle USC = 70$  then  $m\angle USA =$  \_\_\_\_\_
8. If  $\angle A$  is a complement to  $\angle M$ , and  $\angle C$  is a complement to  $\angle M$ , what is the relationship of  $\angle A$  and  $\angle M$ ?
  - a) congruent
  - b) complementary
  - c) supplementary
  - d) obtuse