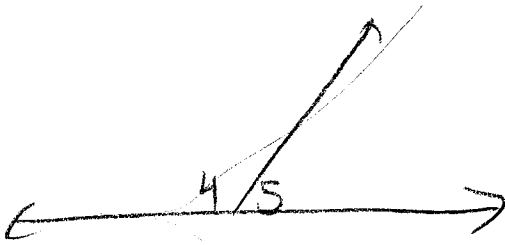


Name Key  
Math 423—Pulford

Date \_\_\_\_\_  
Lesson 5

### Using the Essentials of Geometry

1. Angle 4 and angle 5 form a linear pair. The measure of angle 4 is forty more than three times a number and the measure of angle 5 is two times that number. Find the number.



$$m\angle 4 = 3x + 40$$

$$m\angle 5 = 2x$$

$$3x + 40 + 2x = 180$$

$$5x = 140$$

$$x = 28$$

2. The measure of an angle is  $40^\circ$  more than the measure of its supplement. Find the measure of the angle.

Let  $x$  be an angle  
 $180 - x$  be its complement

$$x + 40 = 180 - x$$

$$2x = 140$$

$$x = 70$$

$$110^\circ$$

3.  $\angle ABD$  and  $\angle DBC$  form a linear pair. If  $m\angle ABD = x$  and  $m\angle DBC = 5x - 60$ , find the value of  $m\angle DBC$ .

$$x + 5x - 60 = 180$$

$$6x = 240$$

$$x = 40$$

$$5(40) - 60$$

$$140^\circ$$

4. The supplement of the complement of an acute angle is always:

(1) an acute angle

(2) a right angle

(3) an obtuse angle

(4) a straight angle

Choose  
an acute  
angle, say  $10^\circ$   
complement  $\rightarrow 70^\circ$

supplement  
of complement  $\rightarrow 110^\circ$

In 5 - 7, given:  $\angle GKH$  and  $\angle HKI$  are a linear pair;  $\overline{KH} \perp \overline{KJ}$ ;  $m\angle IKJ = 34$ .

5. Find  $m\angle HKI$ .

$$90 - 34$$

$$56^\circ$$

6. Find  $m\angle HKG$ .

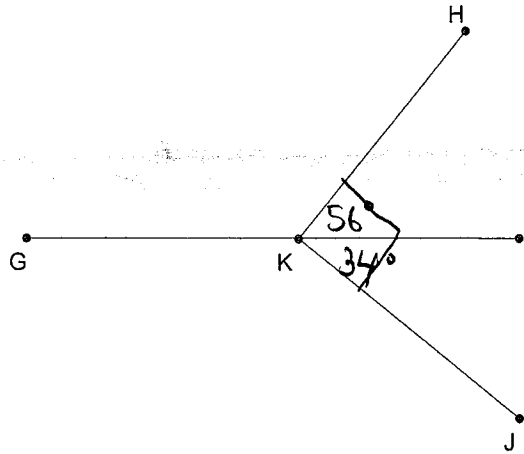
$$180 - 56$$

$$124^\circ$$

7. Find  $m\angle GKJ$ .

$$180 - 34$$

$$146^\circ$$



1 8. Two complementary angles have measures in the ratio 2:4. What is the measure of the larger angle?

- (1)  $60^\circ$
- (2)  $30^\circ$

- (3)  $120^\circ$
- (4)  $80^\circ$

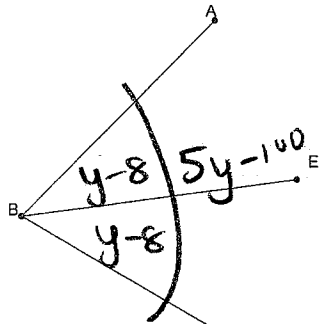
$$\begin{aligned} 2x + 4x &= 90 \\ 6x &= 90 \\ x &= 15 \end{aligned}$$

$$4(15) = 60^\circ$$

3 9. Which one of the following statements is true?

- (1) A line is limited in length
- (2) A plane has boundaries that are lines
- (3) A point has no length, width, or thickness
- (4) Three points determine a line.

10. If  $\overline{BE}$  bisects  $\angle ABD$ ,  $m\angle ABE = (y - 8)$  and  $m\angle ABD = (5y - 100)$ , find the value of  $y$ .



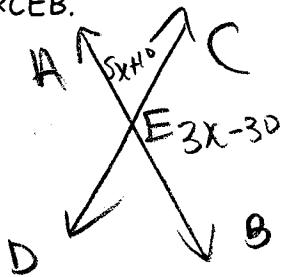
$$y-8 + y-8 = 5y-100$$

$$2y-16 = 5y-100$$

$$84 = 3y$$

$$y = 28$$

11. If line AB and line CD intersect at E.  $m\angle AEC = 5x + 10$  and  $m\angle CEB = 3x - 30$ , find  $m\angle CEB$ .



$$5x+10 + 3x-30 = 180$$

$$8x-20 = 180$$

$$8x = 200$$

$$x = 25$$

$$75-30$$

$$m\angle CEB = 45^\circ$$

12. 3

Which of the following is *not* an undefined term in geometry?

- |          |          |
|----------|----------|
| 1. point | 3. ray   |
| 2. line  | 4. Plane |

13. 4

If  $\angle C$  is the complement of  $\angle A$ , and  $\angle S$  is the supplement of  $\angle A$ , which statement is *always* true?

- (1)  $m\angle C + m\angle S = 180$
- (2)  $m\angle C + m\angle S = 90$
- (3)  $m\angle C > m\angle S$
- (4)  $m\angle C < m\angle S$

Choose a number

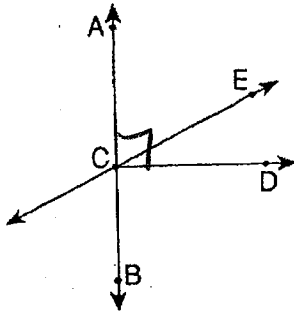
$$m\angle A = 10^\circ$$

$$m\angle C = 80^\circ$$

$$m\angle S = 170^\circ$$

14. 3

In the accompanying diagram,  $AB$  intersects  $\overleftrightarrow{CE}$  and  $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$ .



Which statement is true?

- (1)  $\angle ACE \cong \angle BCD$ .
- (2)  $B$ ,  $C$ , and  $D$  are collinear.
- (3)  $\angle ACE$  and  $\angle ECD$  are complementary.
- (4)  $\angle ACE$  and  $\angle ECD$  are supplementary.

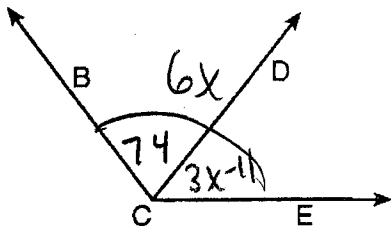
15. 2

Which one of the following statements is false?

- (1) A line is an undefined term in geometry.
- (2) A plane has boundaries that are lines
- (3) A point has no length, width, or thickness
- (4) Two points determine a line.

16.

In the accompanying diagram,  $m\angle ECB = 6x$ ,  $m\angle ECD = 3x - 11$ , and  $m\angle DCB = 74$ . What is the value of  $x$ ?



$$\begin{aligned} 3x - 11 + 74 &= 6x \\ 3x + 63 &= 6x \\ 63 &= 3x \\ \underline{21} &= x \end{aligned}$$