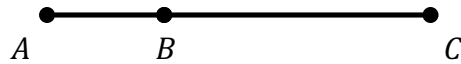


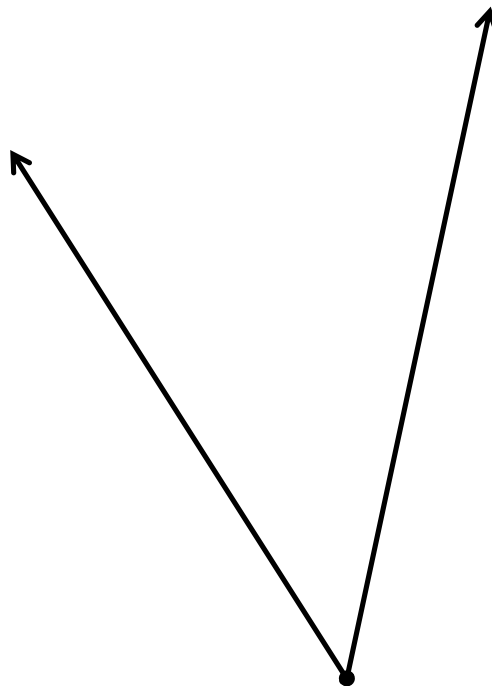
**Midterm Exam**

**Constructions**

1. Construct a perpendicular bisector of  $\overline{AC}$  using a compass and straight edge. (3 points)



2. Construct an angle bisector of the given angle. (3 points)



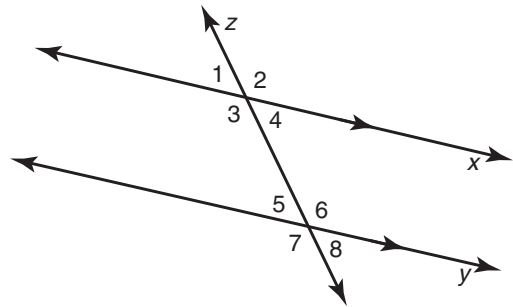
3. The measure of angle  $T$  is  $70^\circ$ .

a. What is the measure of an angle that is complementary to angle  $T$ ? (1 point)

b. What is the measure of an angle that is supplementary to angle  $T$ ? (1 point)

4. True or false: If  $M$  is the midpoint of  $\overline{AB}$ , then  $AM = MB$ .

5. In the figure, line  $x$  is parallel to line  $y$  and  $m\angle 1 = 40$ . Determine the measure of angle 5. (1 point)



6. Sketch and label each of the following geometric figures.

a. Adjacent, complementary angles  $\angle ABC$  and  $\angle CBD$ . (1 point)

b. Two intersecting lines with vertical angles 1 and 2 and vertical angles 3 and 4. (1 point)

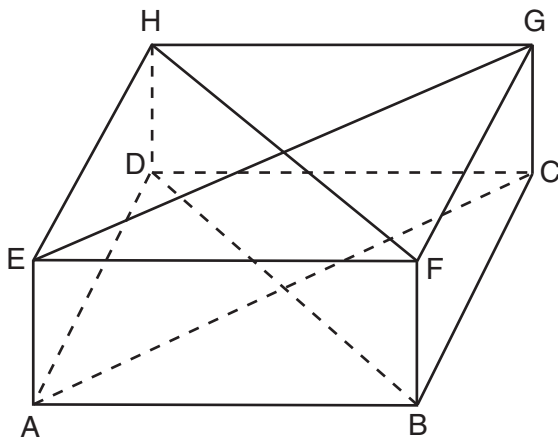
7. Write the letter of the description in front of each term. (1 point each)

- |            |                      |   |
|------------|----------------------|---|
| i. _____   | obtuse angle         | <b>a.</b> two angles whose measures add up to $90^\circ$                              |
| ii. _____  | complementary angles | <b>b.</b> two nonadjacent angles that are formed by two intersecting lines            |
| iii. _____ | adjacent angles      | <b>c.</b> two angles whose measures add up to $180^\circ$                             |
| iv. _____  | vertical angles      | <b>d.</b> an angle whose measure is greater than $90^\circ$ but less than $180^\circ$ |
| v. _____   | supplementary angles | <b>e.</b> two angles that share a common vertex and a common side                     |

(for credit, you must write the correct letters in the blanks)

8.

A rectangular prism is shown in the diagram below.

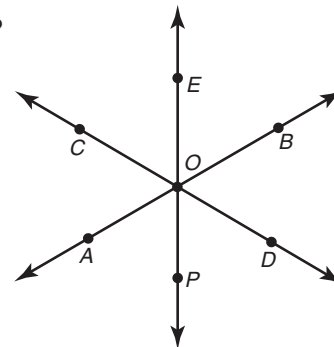


True or false: the points  $E, F, G,$  and  $h$  coplanar.

9. (1 point)

The figure shows intersecting lines. Which choice shows vertical angles?

- $\angle COE$  and  $\angle BOD$
- $\angle COE$  and  $\angle EOD$
- $\angle EOB$  and  $\angle AOP$
- $\angle AOC$  and  $\angle COE$



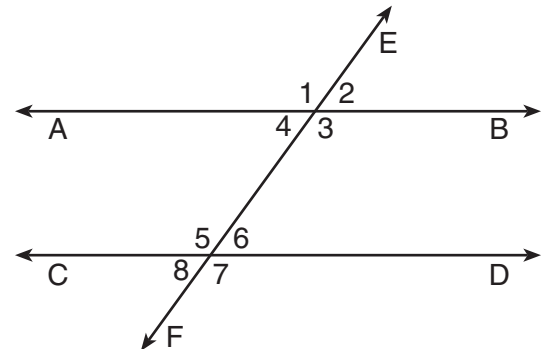
**10.** Given the diagram at right. (1 point each)

a.  $\angle 4$  and  $\angle 8$  are called what kind of angles?

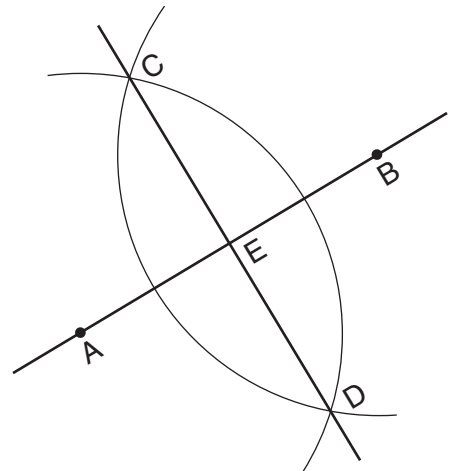
b.  $\angle 1$  and  $\angle 3$  have what relationship?

c. What would you call the angle pair  $\angle 6$  and  $\angle 4$ ?

d. Name a pair of adjacent angles.



**11.** In the construction at right, name two perpendicular lines or line segments. Use proper notation. (1 point)

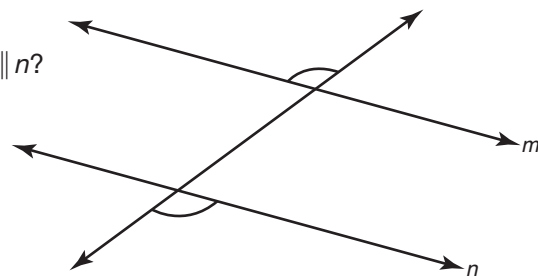


**12.** (1 point)

In the figure, two angles are marked congruent.

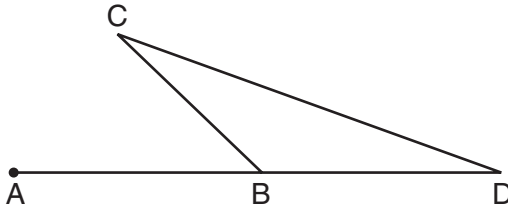
Which theorem or postulate justifies the conclusion that  $m \parallel n$ ?

- a. Alternate Exterior Angle Theorem
- b. Alternate Exterior Angle Converse Theorem
- c. Corresponding Angle Converse Postulate
- d. Vertical Angle Theorem



**13.**

In the diagram below of  $\triangle BCD$ , side  $\overline{DB}$  is extended to point A.



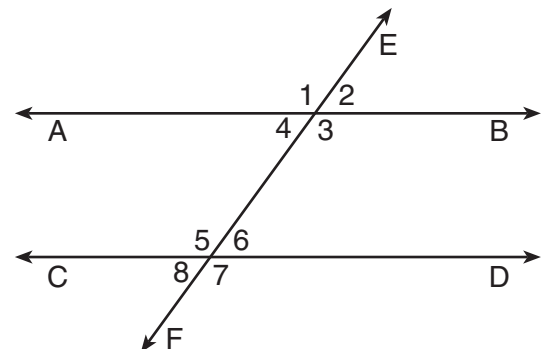
a. Name an obtuse angle.

b. Name two angles that make up a linear pair.

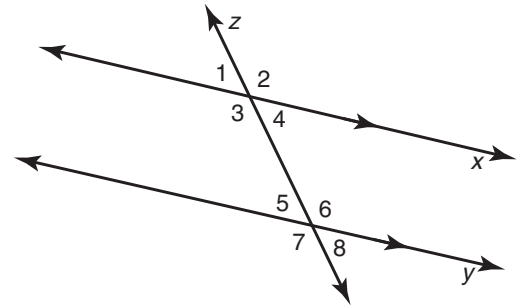
**14.** If  $\angle A$  and  $\angle B$  are supplementary angles and the  $m\angle A$  is three times the  $m\angle B$ , find  $m\angle A$  and  $m\angle B$ .  
(2 points)

**15.** At right, name two angles that form linear pairs with  $\angle 1$ .

a. b.



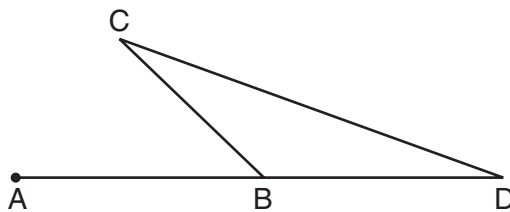
**16.** In the given diagram the lines  $x \parallel y$ , and  $m\angle 1 = x + 25$  and  $m\angle 5 = 60$ .  
Solve for  $x$  (2 points)



**17.**

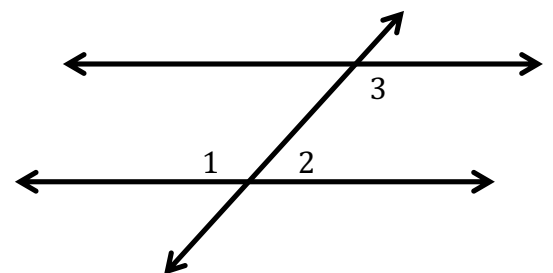
In the diagram below of  $\triangle BCD$ , side  $\overline{DB}$  is extended to point A.

Given  $m\angle ABC = 40$ . What is  $m\angle CBD$ ?



**18.** Of two supplementary angles, one has a measure of 150 degrees. What is the measure of the other angle?

**19.** In the diagram at right, two parallel lines intersect a transversal line  
a. Name two supplementary angles



b. What is the sum of the measures of  $\angle 1$  and  $\angle 2$ ?

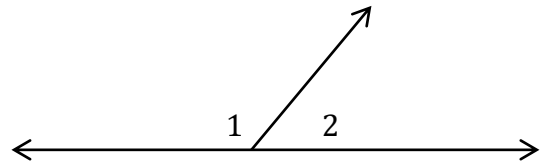
**20.** True or false: If  $\angle 1$  and  $\angle 2$  are complementary angles, then the sum of  $m\angle 1$  and  $m\angle 2$  is 180 degrees.

**21.** Given  $m\angle 1 = 10x + 40$ ,  $m\angle 2 = 2x + 20$  as shown in the figure. Solve for  $x$  and the measures of the two angles. Show the steps and check your result. (6 points)

Geometry:

Substitute:

Solve algebra:



$$x =$$

$$m\angle 1 =$$

$$m\angle 2 =$$

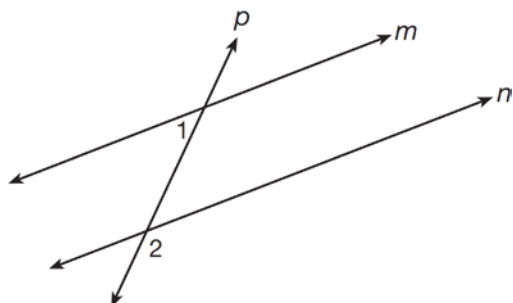
Check:

**22.** The measures of two interior angles of a triangle are 50 degrees and 35 degrees. What is the measure of the third angle? (1 point)

**23.** The measures of the angles of triangle are represented by  $x$ ,  $3x+10$ , and  $2x+110$ . Solve for  $x$ . (2 points)

24.

As shown in the diagram below, lines  $m$  and  $n$  are cut by transversal  $p$ .

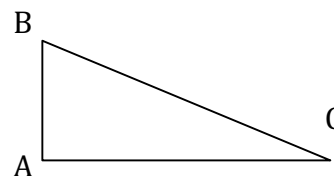


Given  $m\angle 1 = 48$ . What must be true for lines  $m$  and  $n$  to be parallel?

- |                                   |   |
|-----------------------------------|---|
| (1) $m\angle 1 + m\angle 2 = 180$ | (3) $\angle 1$ & $\angle 2$ are complementary   |
| (2) $\angle 1 \cong \angle 2$     | (4) $\angle 1$ & $\angle 2$ are vertical angles |

25. Right triangle  $ABC$  shown at right.  $\overline{AB} \perp \overline{AC}$  and  $m\angle B = 65$ . What is the measure of angle  $C$ ?

- |         |        |
|---------|--------|
| (1) 155 | (3) 25 |
| (2) 145 | (4) 65 |



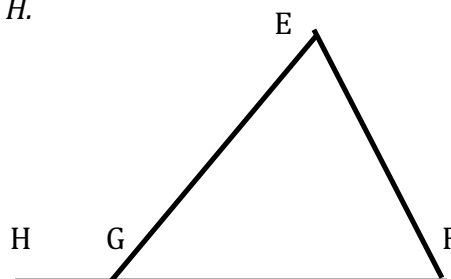
26. In the diagram of  $\triangle EFG$  at right,  $\overline{FG}$  is extended through  $H$ .

$$m\angle E = 50$$

$$m\angle EGH = 115$$

$$m\angle F = ?$$

- |         |        |
|---------|--------|
| (1) 165 | (3) 15 |
| (2) 65  | (4) 50 |



27.  $\triangle ABC$  with the given angle measures. Solve for  $x$ .

$$m\angle A = 40$$

$$m\angle B = x - 20$$

$$m\angle C = 2x + 10$$