Geometry Unit 2 - Day 1 – Parallel Lines and Planes
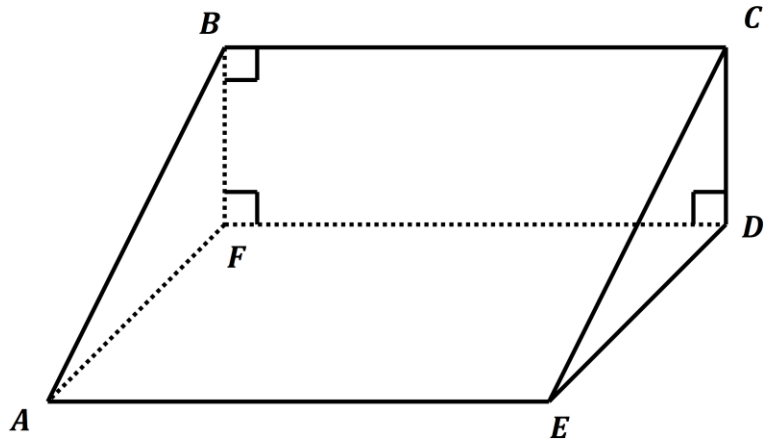
Describe each pair of segments in the prism as parallel, skew, perpendicular, or intersecting.

1. $\overline{AF}, \overline{FD}$ *Perpendicular or ⊥*

2. $\overline{AE}, \overline{FD}$ *Parallel or ∥*

3. $\overline{AB}, \overline{FD}$ *Skew*

4. $\overline{BC}, \overline{AE}$ *Parallel or ∥*

5. $\overline{EC}, \overline{BF}$ *Skew*

6. $\overline{BF}, \overline{AB}$ *Intersecting*

Name the parts of the cube shown at the right.

7. Six planes   *Plane HNMG   Plane GMKI   Plane GMKI*
Plane NLKM   Plane GIJH   Plane GIJH

8. All segments parallel to $\overline{GI}$ *$\overline{HJ}, \overline{NL}, \overline{MK}$*

9. All segments skew to $\overline{MN}$ *$\overline{GI}, \overline{GH}, \overline{JL}, \overline{IK}$*

10. All segments parallel to $\overline{IK}$ *$\overline{GM}, \overline{NH}, \overline{JL}$*

11. All segments skew $\overline{HJ}$ *$\overline{KI}, \overline{MN}, \overline{KL}, \overline{GM}$*
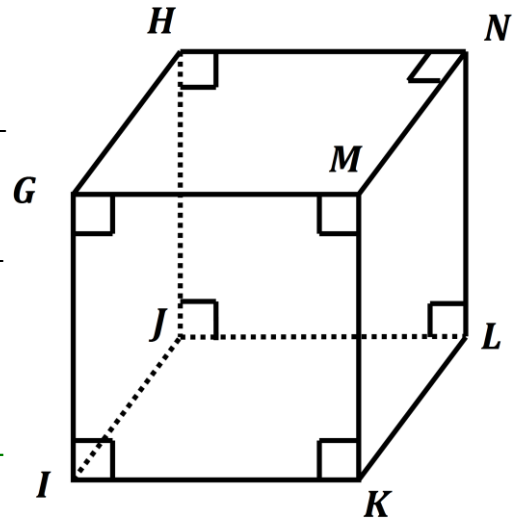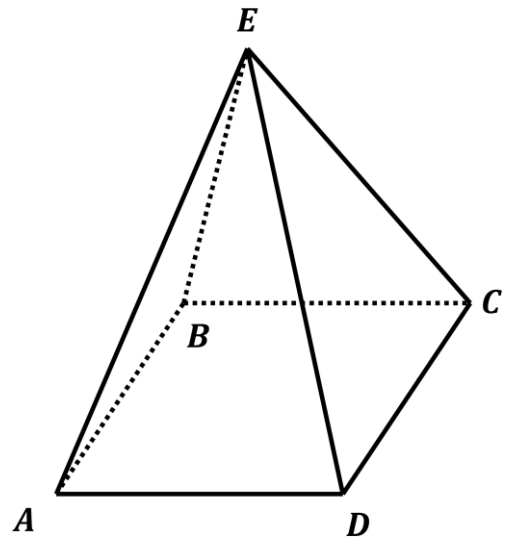
12. A pairs of parallel segments

$$\overline{BC} \parallel \overline{AD} \ or \ \overline{AB} \parallel \overline{CD}$$

13. A pairs of skew segments

$$\overline{CE} \ \& \ \overline{AD}, \overline{BE} \ \& \ \overline{CD}, \overline{BC} \ \& \ \overline{ED}$$
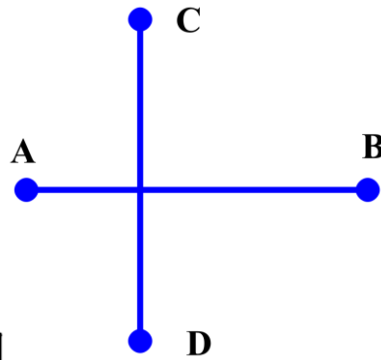
14. All panes parallel to plane *EDC*

NONE

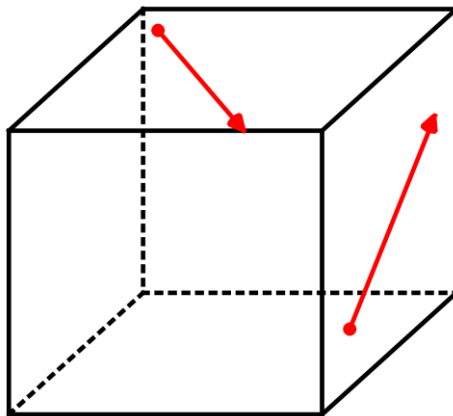**15.** All planes that interest to form the line $\overline{BC}$

Plane ECB and Plane ADCB
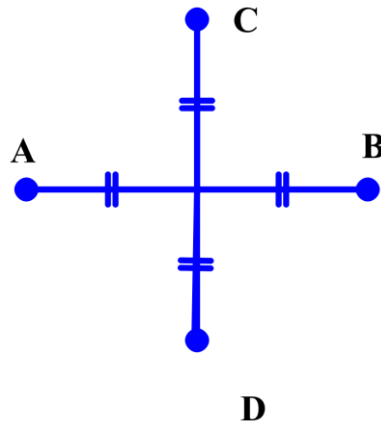
Draw and Label the following to illustrate each pair.

16. Segments that are not parallel nor skew

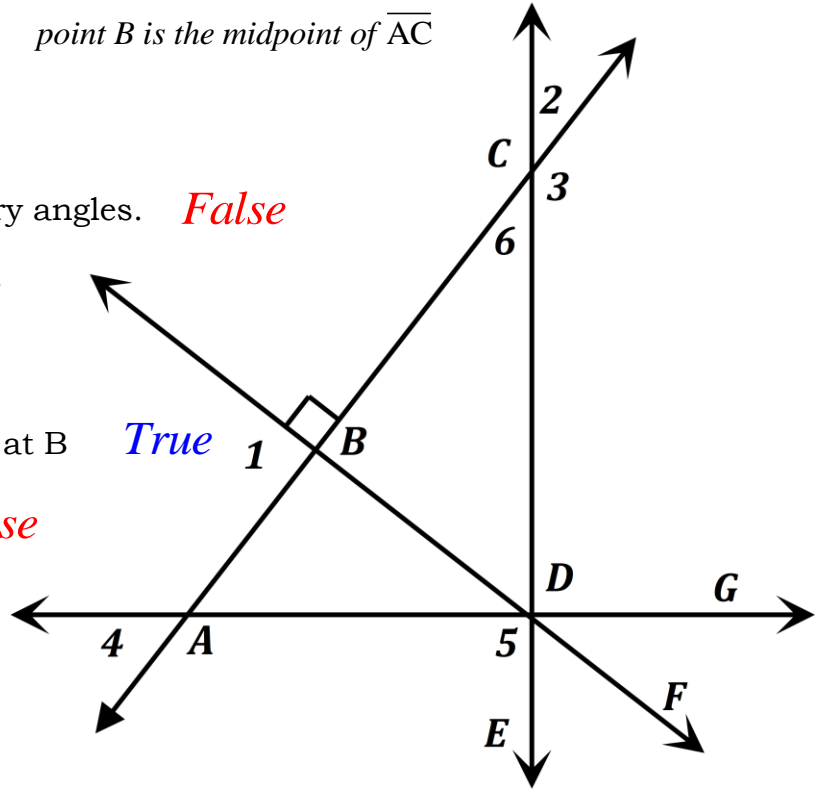
17. Skew rays

18. Intersecting $\cong$ segments

Given the following diagram and given in formation. For 19 – 33, determine whether the following information is true or false.

$\overleftrightarrow{AG} \perp \overleftrightarrow{CE}, \ \overleftrightarrow{AC} \perp \overleftrightarrow{BF},$

point B is the midpoint of $\overline{AC}$

19. $\angle 1 \cong \angle CBD$ *True*

20. $\angle 1$ is a right angle.   *True*

21. $\angle 2$ and $\angle 3$ are complementary angles.   *False*

22. $m\angle GDF + m\angle FDE = 90$ *True*

23. $\angle 1 \cong \angle 5$ *True*

24. $\overrightarrow{AC}$ is the only line $\perp$ to $\overrightarrow{BF}$ at B   *True*

25. $\angle 3$ is an acute angle   *False*

26. $\angle 1 \cong \angle 2$ *False*

27. $\angle 2 \cong \angle 6$ *True*

28. $\overrightarrow{AG}$ is $\perp$ to $\overrightarrow{DE}$ *True*

29. Name four right angles.

$$\angle 1, \angle CBD, \angle ADC, \angle 5$$

30. Name a pair of supp. Angles. $\angle 2 \ \& \ \angle 3$

$$\angle 4 \ \& \ \angle A$$

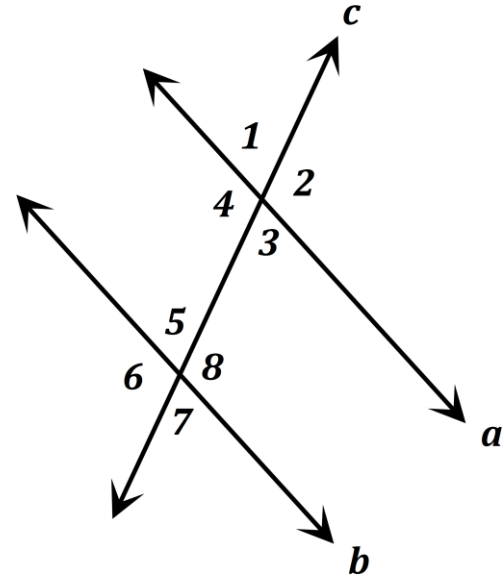**31.** If $m\angle 3 = 120$, find $m\angle 2$

$$60$$

32. Which angle is complementary to $\angle FDE$ $\angle GDF$

**33.** If $m\angle 6 = 45$, find $m\angle 2$ 45

Geometry Unit 3 - Day 2 – Parallel Lines cut by a Transversal

Use the diagram for 1 – 7 to the right to identify each pair of angles as Alternate Interior, Alternate Exterior, Consecutive Interior, Corresponding, Linear Pair, Vertical Angles, or none.
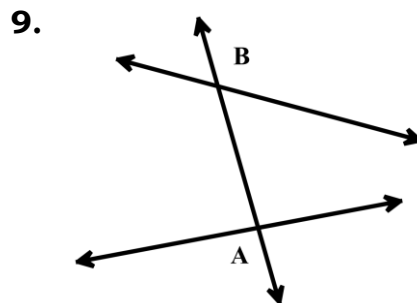
1. ∠1 and ∠7 _____*Alternate Exterior*_____

2. ∠1 and ∠5 _____*Corresponding*_____

3. ∠8 and ∠6 _____*Vertical Angles*_____

4. ∠8 and ∠5 _____*Linear Pair*_____

5. ∠4 and ∠8 _____*Alternate Interior*_____

6. ∠4 and ∠5 _____*Consecutive Interior*_____

7. ∠6 and ∠7 _____*Linear Pair*_____

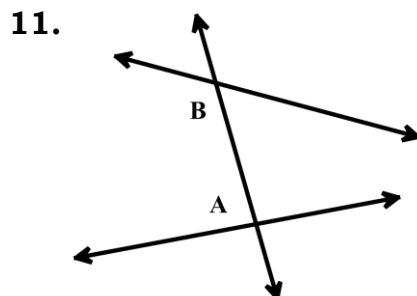**State the relationship between angle A and B.**
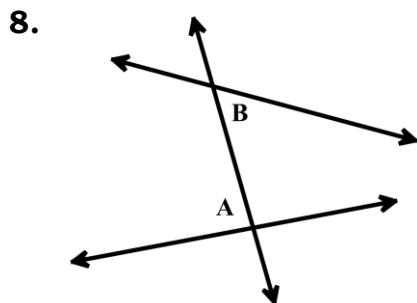
8.

Alternate Interior

9.

Alternate Exterior

10.

Corresponding

11.

Consecutive Interior

12.

Vertical Angles

13.
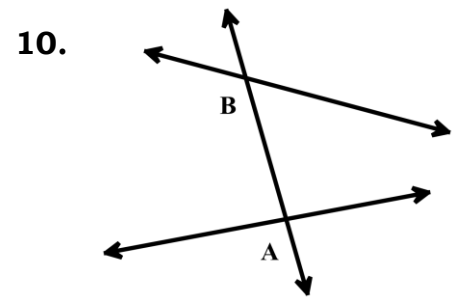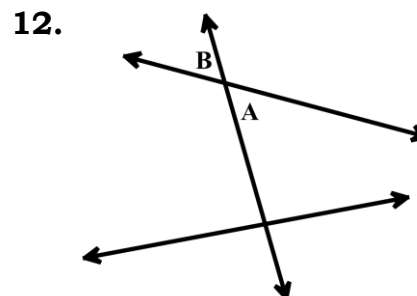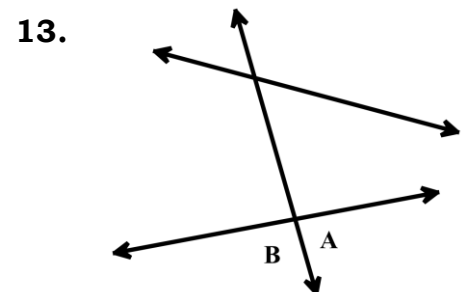
*Linear Pair*

Use the diagram for 14 – 21 to the right to identify each pair of angles as Alternate Interior, Alternate Exterior, Consecutive Interior, Corresponding, Linear Pair, Vertical Angles, or none.

14. $\angle 9$ and $\angle 11$ *Linear Pair*

15. $\angle 3$ and $\angle 9$ *Consecutive Interior*

16. $\angle 3$ and $\angle 12$ *none*

17. $\angle 14$ and $\angle 16$ *Linear Pair*

18. $\angle 8$ and $\angle 15$ *none*

19. $\angle 4$ and $\angle 5$ *Alternate Interior*

20. $\angle 1$ and $\angle 7$ *none*

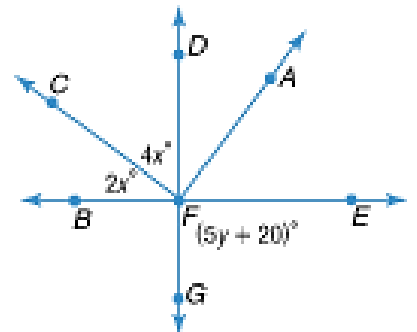21. $\angle 8$ and $\angle 6$ *Linear Pair*
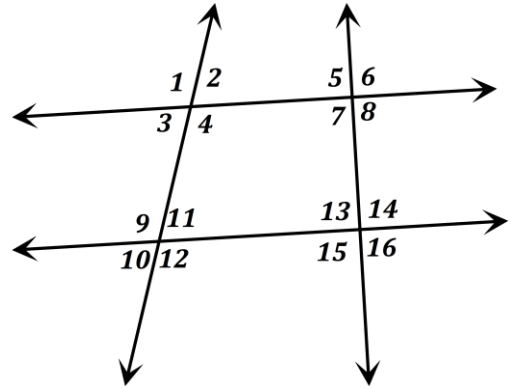
Mixed Review:

Refer to the figure to identify each of the following.

1. all segments parallel to $\overline{AE}$ *LP*
2. all planes intersecting plane BCN *Lots*
3. all segments skew to $\overline{DC}$ *Lots*

4. **Find x and y so that $\overrightarrow{DG}$ and $\overrightarrow{BE}$ are perpendicular.**
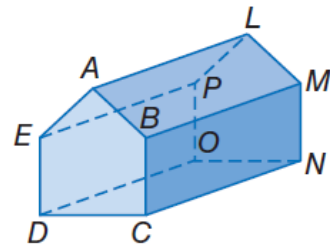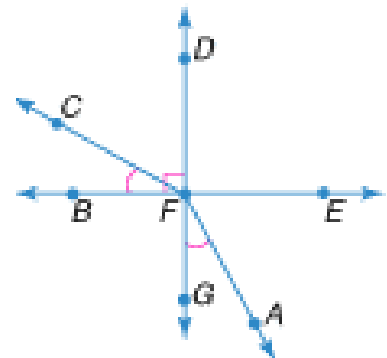
$x = 15$

$y = 14$

5. **Determine whether each statement can be assumed from the figure. Explain.**

a. $\angle BFC$ and $\angle AFG$ are complementary.

No

b. $\angle DFA$ and $\angle AFG$ are a linear pair.   *Yes*

c. $\angle DFC$ and $\angle BFC$ are complementary.   *Yes*

Geometry Unit 2 - Day 3 – Parallel Lines Cut by a Transversal

Complete the statement with Alternate Interior, Alternate Exterior, Consecutive Interior, Corresponding, Linear Pair, Vertical Angles, or none.

1 $\angle 3$ and $\angle 7$ are ____ angles.

2. $\angle 4$ and $\angle 5$ are ____ angles.

3. $\angle 2$ and $\angle 8$ are ____ angles.

4. $\angle 1$ and $\angle 6$ are ____ angles.
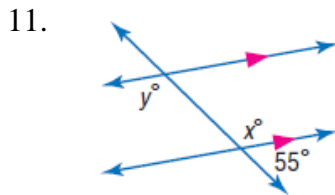
5. $\angle 4$ and $\angle 6$ are ____ angles.
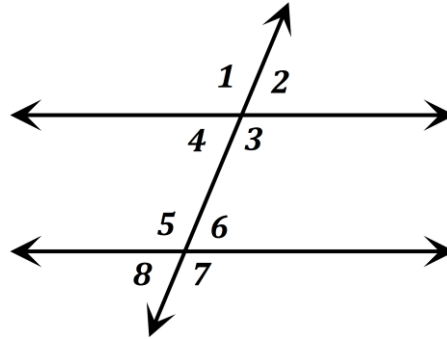
1. _____ *Corresponding*

2. _____ *Consecutive Interior*

3. _____ *Alternate Exterior*

4. _____ *None*

5. _____ *Alternate Interior*

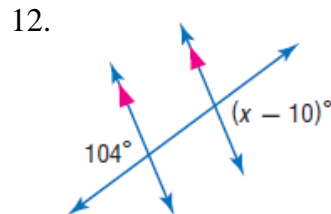**In the figure, $m\angle 1 = 94^\circ$, find the measure of each angle and state which theorems you used.**

6. $m\angle 7 =$ __94°__ $^\circ$ because of _____ *Alternate Exterior with $\angle 1$*

7. $m\angle 5 =$ __94°__ $^\circ$ because of _____ *Corresponding with $\angle 1$*

8. $m\angle 3 =$ __94°__ $^\circ$ because of _____ *Vertical Angles with $\angle 1$*

9. $m\angle 2 =$ __86°__ $^\circ$ because of _____ *Linear Pair*

10. $m\angle 8 =$ __86°__ $^\circ$ because of _____ *Linear Pair with $\angle 7$*
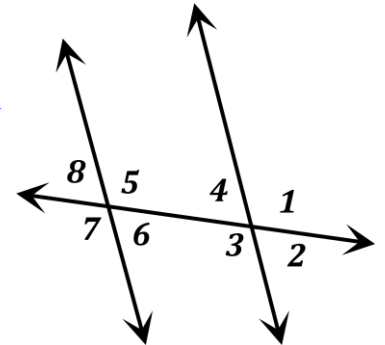
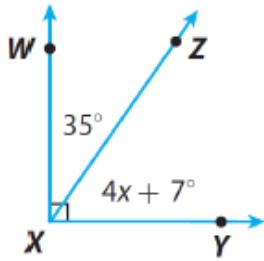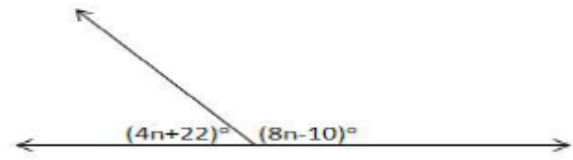Find the value of the variable(s) in each figure. Explain your reasoning.

11.

y°

x°

55°

$x = 125$

$y = 125$

12.

$(x - 10)^\circ$

104°

$x = 114$

13.

$(2x - 15)^\circ$

$(x + 55)^\circ$

$x = 70$

14.

$35°$

$4x + 7°$

W, Z, X, Y

$x = 12$

15.

$(4n+22)°$ $(8n-10)°$

$x = 14$

16.

$(3x - 14)°$ m

n

$(2x + 25)°$

$x = 39$

17.

$(5x - 20)°$ m

n

$x = 22$

18.

m n

$(21 + 2x)°$

$(x + 84)°$

$x = 63$

19

$(7x - 2)°$ m

$(10 - 3x)°$ n

$x = 43$

20.

m n

$(2x + 45)°$

$(3x)°$

$x = 27$

21.

m n

$(6x - 144)°$ $(2x)°$
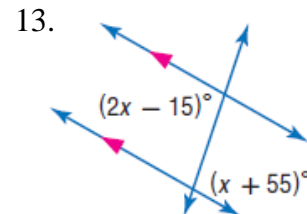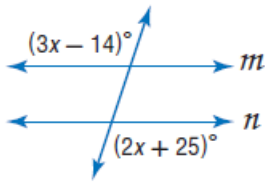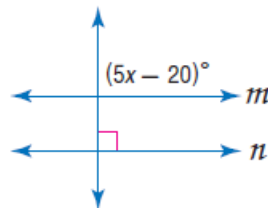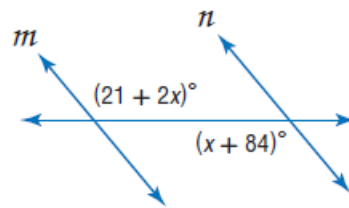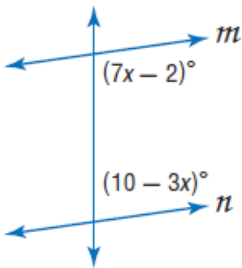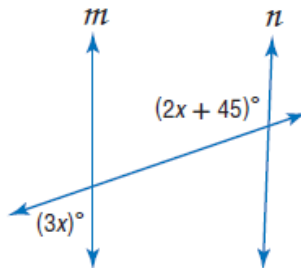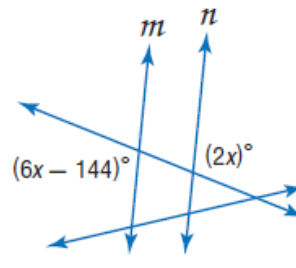
$x = 36$

22. Draw two lines and a transversal such that ∠1 and ∠2 are alternate interior angles, ∠2 and ∠3 are corresponding angles, and ∠3 and ∠4 are alternate exterior angles. What type of angle pair is ∠1 and ∠4?

3
1
2
4

Cooresponding Angles
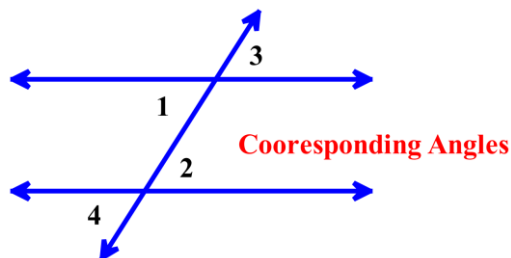
Mixed Review:
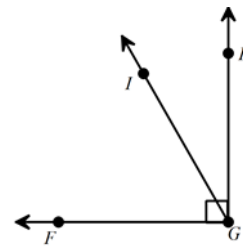
Excluding straight angles, how many angles are shown in the figure?

$$24$$
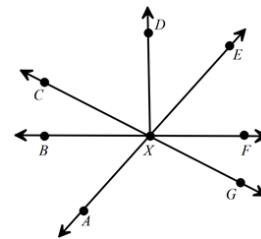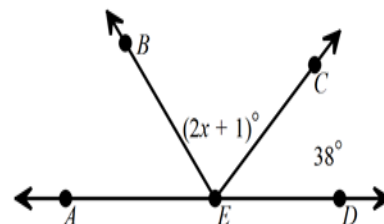
In the figure $m\angle FGI = (2x + 9)°$ and $m\angle HGI = (4x - 15)°$. Find $m\angle FGI$.
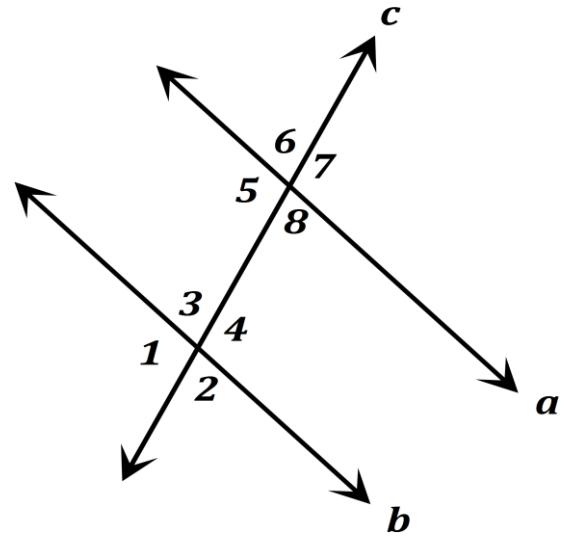
$$x = 41$$

$\overrightarrow{EB}$ is the angle bisector of $\angle AEC$. What is the value of x?

Geometry Unit 2 - Day 4 – Proving Lines Parallel

Use the diagram for 1 – 7 to the right to identify each pair of angles as Alternate Interior, Alternate Exterior, Consecutive Interior, Corresponding, Linear Pair, Vertical Angles, or none.

1. ∠1 and ∠7 _____*Alternate Exterior*_____

2. ∠1 and ∠5 _____*Corresponding*_____

3. ∠8 and ∠6 _____*Vertical Angles*_____

4. ∠8 and ∠5 _____*Linear Pair*_____

5. ∠4 and ∠8 _____*Consecutive Interior*_____

6. ∠4 and ∠5 _____*Alternate Interior*_____

7. ∠2 and ∠8 _____*Corresponding*_____

In each example, determine if the lines are parallel or not. Explain why or why not.

8.

Yes, they are ∥

Alt. Ext. Converse

9.

100°
80°

No, they aren't ∥

Alt. Int. not ≅

10.

82°
102°

No, they aren't ∥

Consec. Int. not supp

11.

120°
120°

Yes, they are ∥

Alt. Int. Converse

12.

85°
95°

No, they aren't ∥

Alt. Ext. not ≅

13.

No, they aren't ∥

14.
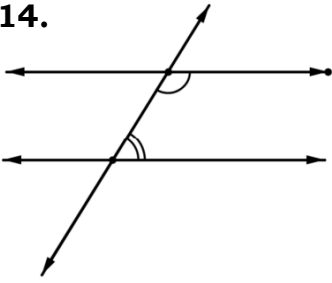
No, they aren't ∥

Consec. Int. not sup p

15.

48° 132°

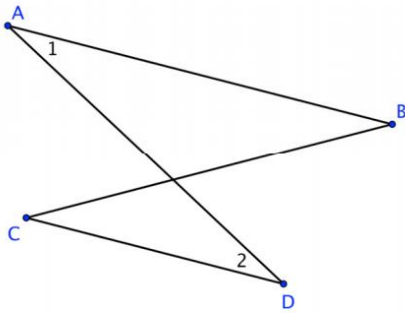*No, they aren't ∥*

16.

134°

134°
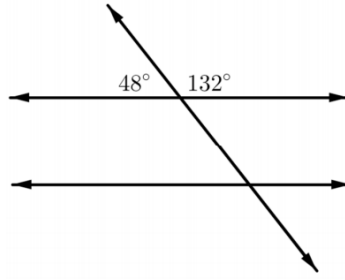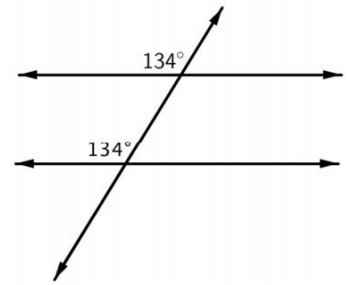
Yes, they are ∥
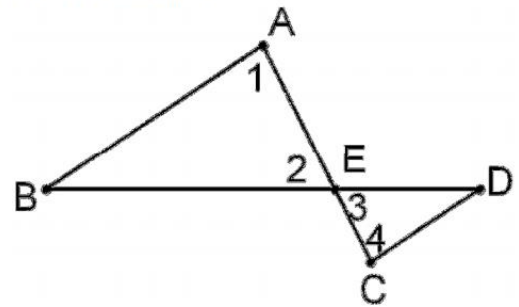
Corr. ∠ Converse

17. Given $\angle 1 \cong \angle 2$, is $\overline{AB} \parallel \overline{CD}$? Why or why not?

A

1

B

C

2

D

Yes, they are ∥

Alt. Int. Converse

18. Given: $\angle 1 \cong \angle 2, \angle 3 \cong \angle 4$
Prove: $\overline{AB} \parallel \overline{CD}$

A

1

2 E

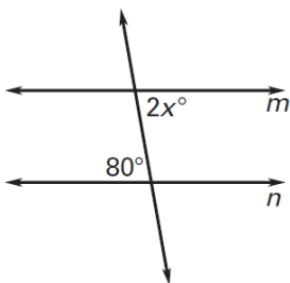B   3   D
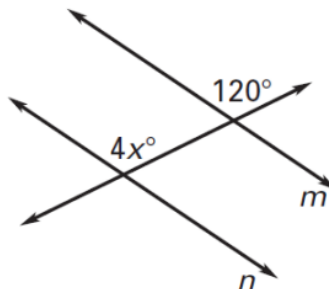
4

C

Yes, they are ∥

Alt. Int. Converse

Find the value of x that makes $m \parallel n$.

19.

$2x°$ m

80°

n

$x = 40$

20.

120°

$4x°$

m

n

$x = 30$

21.

m

$(3x + 15)°$ n

75°

$x = 30$

22.

90°

m

$(5x + 20)°$

n

$x = 14$

23. Which two lines a

b

a

c

110°   65°   d

60°

120°   e

$d \parallel e$

r   s

80°

75°   t

105°   u

105°   v
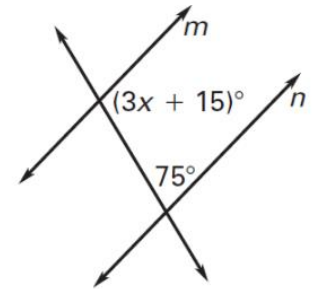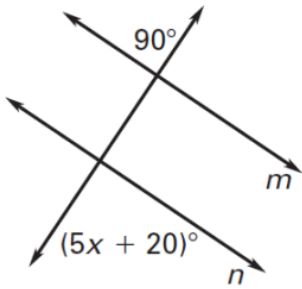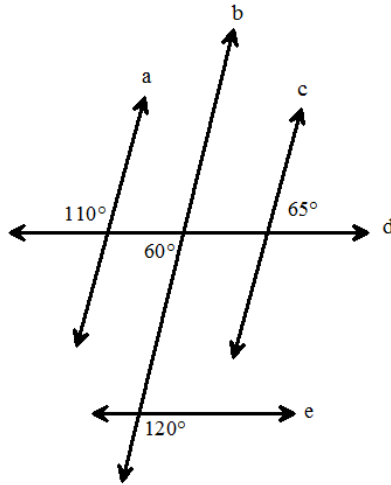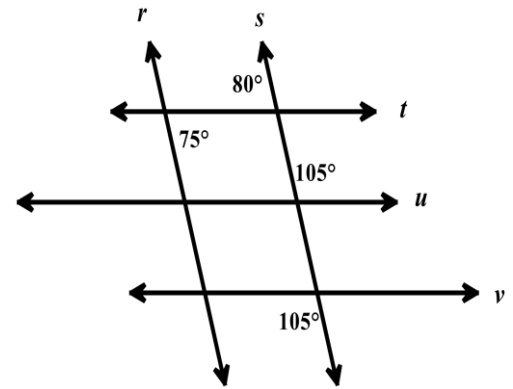
$u \parallel v$

24. Carlos constructed 3 parallel lines as part of an art project. He also drew a line passing through each of them. Some of the angles formed by the intersection of line t, l, m, and n are numbered below. Select all of the conjectures that are correct.

a. Angles, 1, 2, and 3 are congruent.
b. Angles 1, 3, and 5 are congruent.
c. Angles 2, 4, and 6 are congruent.
d. Angles 2, and 4 are supplementary.
e. Angles 5, and 6 are supplementary.
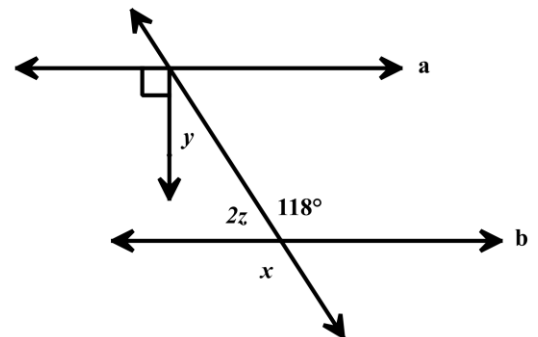**f.** Angles 2, and 3 are supplementary.

l   1 2

m   3 4

n   5 6
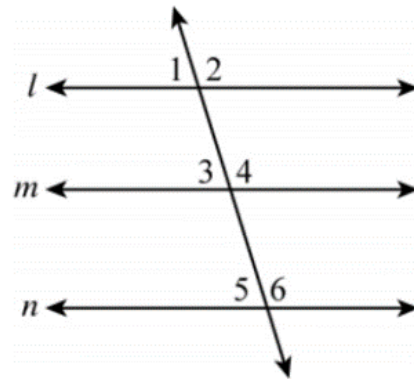
25. Given the following diagram and $a||b$, solve for the variables.

$x = 118$

$y = 28$

$z = 31$
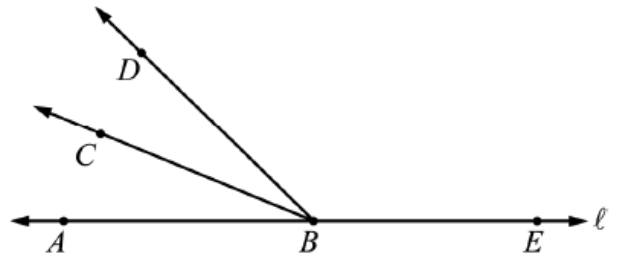
a

y

$2z$ 118°

x   b

Mixed EOC Review:

1. Planes *P* and *R* are parallel, and line *ℓ* is in plane *R*. Which of the following is true?

  A Every line that is perpendicular to *ℓ* intersects plane *P*.
  B Every line in plane *P* is parallel to *ℓ*.
  C No line in plane *P* is skew to *ℓ*.
  D No line in plane *P* intersects line *ℓ*.

D

2 In the figure below, $\overline{BC}$ bisects $\angle ABD$, and *A*, *B*, and *E* are all points on line *ℓ*.

Which angles must be congruent?

  A $\angle ABC$ and $\angle CBD$
  B $\angle ABC$ and $\angle CBE$
  C $\angle ABD$ and $\angle DBE$
  D $\angle CBD$ and $\angle ABD$

A

3. Michael used a compass and a ruler to construct two parallel lines and a transversal. Which of the following statements is a conjecture that Michael can make about the angles formed by the parallel lines and the transversal.

  a. Pairs of same side interior angles are supplementary.
  b. Pairs of alternate interior angles are supplementary.
  c. Pairs of alternate exterior angles are supplementary.
  d. Pairs of corresponding angles are supplementary.

A

4. In the drawing below, line *h* is parallel to line *k*.
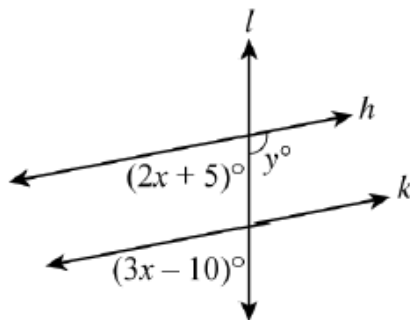
D

What is the value of *y*?

  a. 135   b. 15   c. 35   d. 145