Geometry Unit 2 - Day 1 - Points Lines and Planes Homefun

Use the figure to the right to answer the following questions.

1. Write two other names for $\overleftrightarrow{BG}$

$\overleftrightarrow{BE}, \overrightarrow{BG}, \overleftrightarrow{EB}, \overrightarrow{GE}, \overrightarrow{EG}$

2. Write two lines going through point G.

$\overleftrightarrow{AD}, \overleftrightarrow{BE}, \overleftrightarrow{CF}$

3. Name a point not on the line $\overleftrightarrow{AD}$

B, C, F, E

4. Name three collinear points.

B, G, E
A, G, D
C, G, F
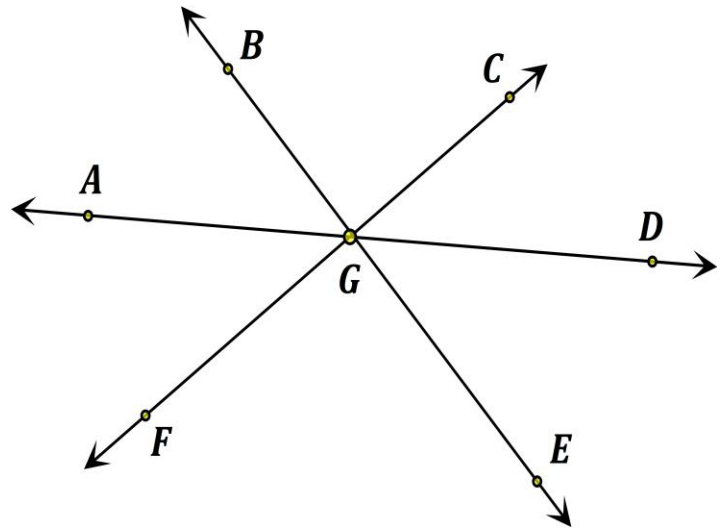
5. Name three non collinear points.

Various

$A, B, C \qquad C, D, E \qquad A, F, G$

6. Are all the points coplanar? Explain.

Yes

Use the figure to the right to answer the following questions.

7. Name the three line segments that intersect at point N. $\overline{MN}, \overline{PN}, \overline{SN}$

8. What do plane *MPRQ* and plane *NMP* have in common? $\overline{MP}$

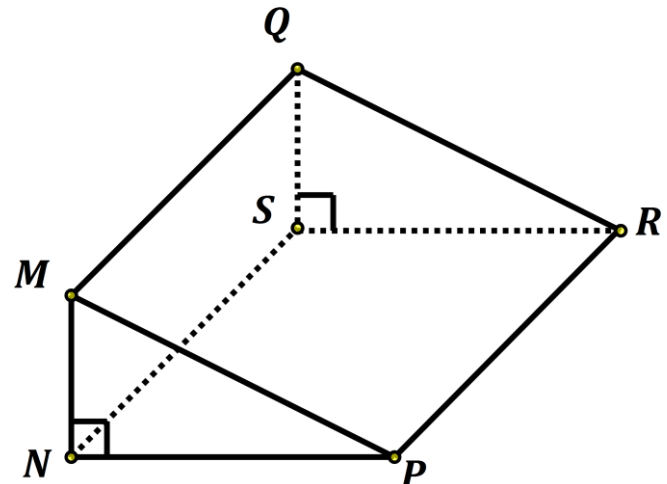**9.** Name two coplanar planes (if possible).

Not Possible

10. Name the two planes that share $\overleftrightarrow{SN}$
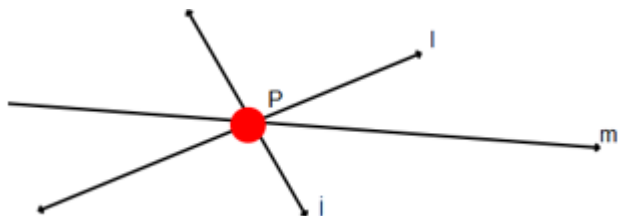
plane SNMQ, plane SNPR

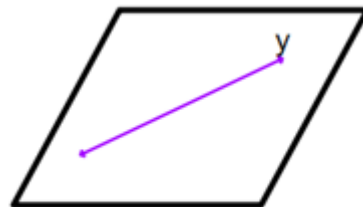**11.** Name three collinear points (if possible).

Not Possible

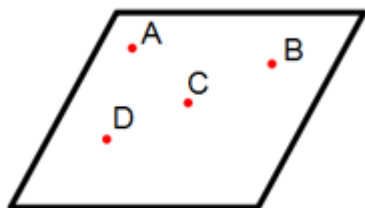**Draw and label a figure for each situation described.**

12. Lines $\ell, m,$ *and* j intersecting at *P.*

13. Plane *W* that contains line *y.*

14. Points *A, B, C,* and *D* are noncollinear.

15) **FIND THE ERROR** Camille and Hiroshi are trying to determine how many lines can be drawn between four points. Is either of them correct? Explain your reasoning.

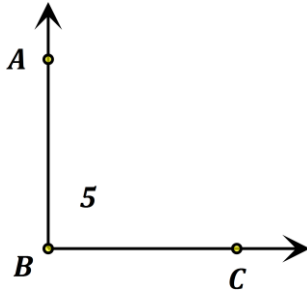| Camille	Hiroshi
Since there are four points, 4 · 3 or 12 lines can be drawn between the points.	You can draw 3 · 2 · 1 or 6 lines between the points.

a) Camille is correct.

b) Hiroshi is correct.

c) They are both correct.

d) Neither of them are correct.

Geometry Unit 2 - Day 2 - Angle Basics

Name each angle in four ways. Then identify its vertex and its sides.

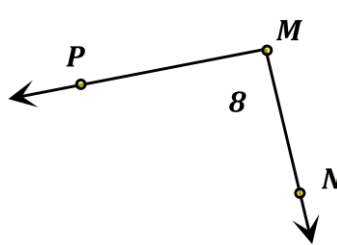**1.**

$Angles: \angle ABC, \angle CBA, \angle C, \angle 5$

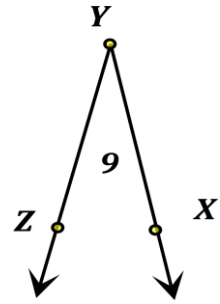$Sides: \overrightarrow{BC}, \overrightarrow{BA}$

$Vertex: B$

2.

$Angles: \angle PMN, \angle NMP, \angle M, \angle 8$

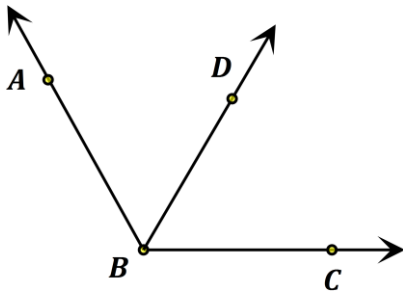$Sides: \overrightarrow{MP}, \overrightarrow{MN}$

$Vertex: M$

3.

$Angles: \angle XYZ, \angle ZYX, \angle Y, \angle 9$

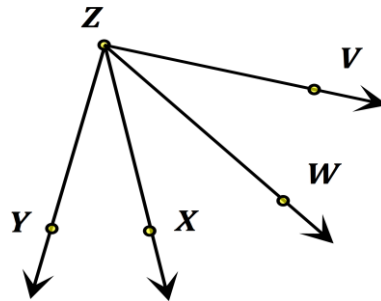$Sides: \overrightarrow{YZ}, \overrightarrow{YX}$

$Vertex: Y$

In the following diagrams, give the total number of angles in the diagram.

4.

3

5.

6

Use the diagram to the right to find the following.

6. Name the vertex of ∠2

E

7. Name the vertex of ∠ADF

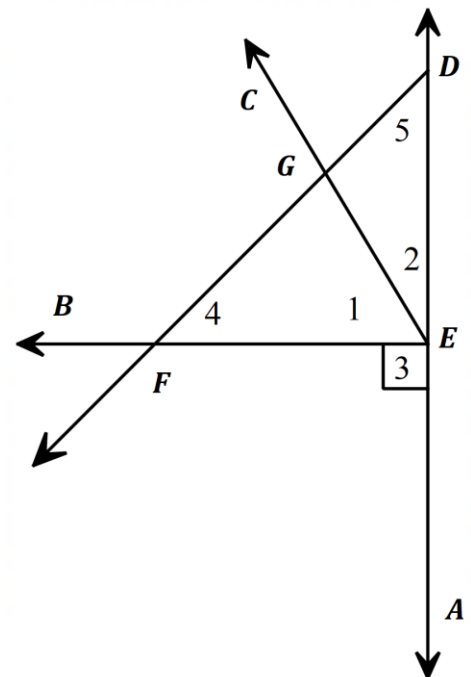**D**

8. Name two other ways to write ∠1

$\angle BEG, \angle FEG, \angle BEC, \angle FEC$

9. Name the right angle in two different ways.

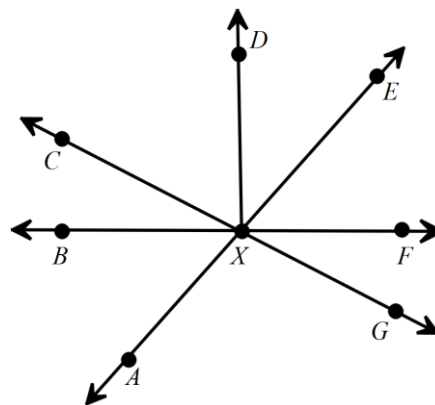$\angle 3, \angle FEA, \angle BEA$

10. Name an angle that appears to be obtuse.

$\angle AEC, \angle BFG, \angle BFD$

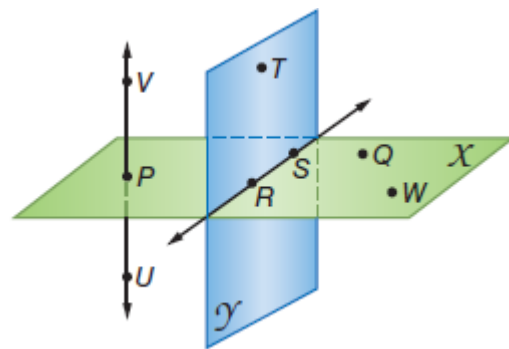**11.** Excluding straight angles, how many angles are shown in the figure?

A. 7

B. 18

C. 19

D. 21

Mixed Review

Use the diagram to the right for 1 – 3.

1. Name another point that is collinear with points U and V. P

2. What is another name for plane $\mathcal{Y}$? *plane RST*

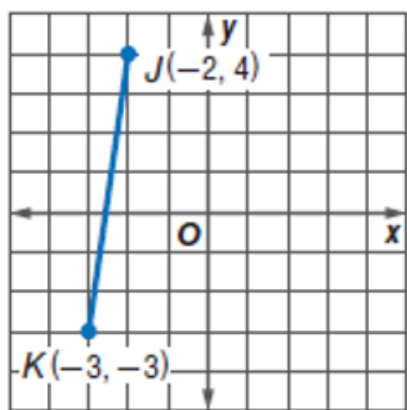3. Name a line that is coplanar with points P, Q, and W.

   Various

$$\overleftrightarrow{RS}, \overleftrightarrow{PQ}, \overleftrightarrow{RP}, \overleftrightarrow{WS}$$

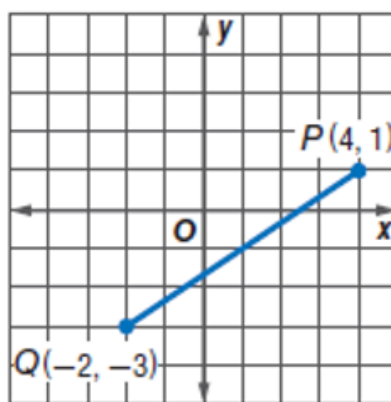## Mixed Review: For 4 – 5, find the midpoint and length of each segment.

5.

$J(-2, 4)$

$K(-3, -3)$

$$d = 5\sqrt{2}$$

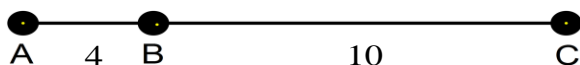$$M = \left(-\frac{5}{2}, \frac{1}{2}\right)$$

6.

$P(4, 1)$

$Q(-2, -3)$

$$d = 4\sqrt{13}$$

$$M = (-1, 1)$$

Geometry Unit 2 - Day 3 – Linear Measure

Directions: Find the Measure of the stated segment.

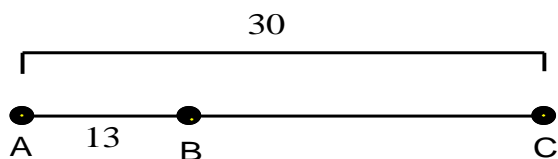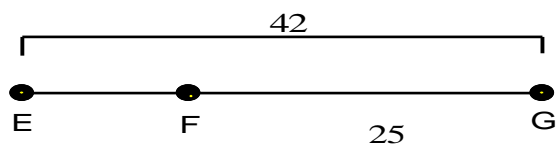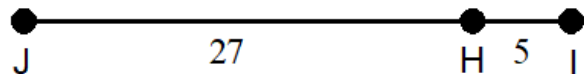**1. AC =** ___14___

A   4   B   10   C

2. DC = ___19.5___

D   9   F   10.5   C

3. BC = ___17___

30

A   13   B   C

4. EF = ___17___

42

E   F   25   G

5. JI = ___32___

J   27   H   5   I

6. NO= ___19___

38

M   19   N   O
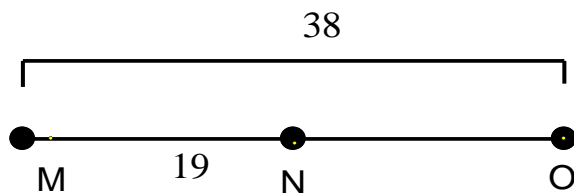
In the diagram below, $MQ = 30$, $MN = 5$, $MN = NO$, and $OP = PQ$. Find the following pieces.

M   N   O   P   Q

7. MP   20

8. NP   15

M   5   N   5   O   10   P   10   Q
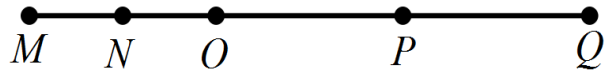
9. NQ   25

For 10 – 12, use the diagram, and that $AD = 24, AB = 5, BC = 9.$

A   B   C   D
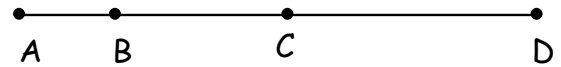
10. Find CD   10

11. Find BD   19

12. Find AC   14

13. Suppose that B is in between A and C. If $AC = 36$, which of the following is not a possibility for AB (select **all** that apply)?

a) −5   **b) 1**   **c) 15.4**   **d) 29**   **e) 37**

Mixed Review:

Solve the following equations and check it.

14. $x^2 - 5x - 14 = 0$
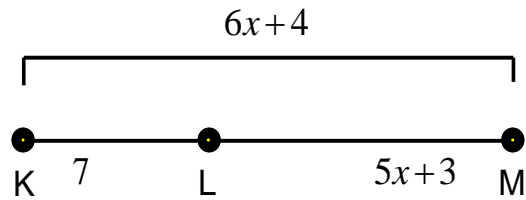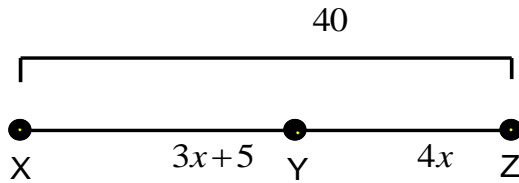
$$x = -2, x = 7$$

15. $x^2 - x - 56 = 0$

$$x = -7, x = 8$$

Geometry Unit 2 - Day 4 – Linear Measure Part II

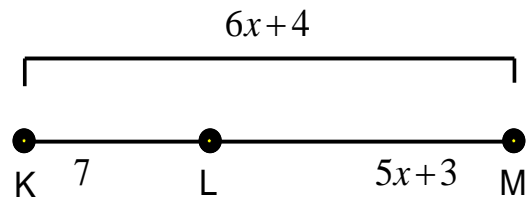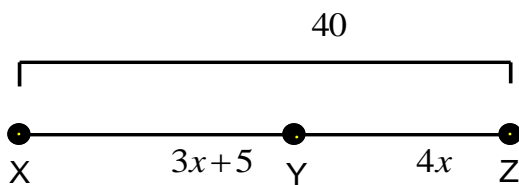**Directions: Use the Segment Addition Postulate to find the value of each variable or segment measure.**

1. $x = $ __5__

40

X ———— $3x+5$ — Y ——— $4x$ — Z

2. $x = $ __6__

$6x+4$

K — 7 — L ——— $5x+3$ — M

3. $XY= $ __20__

40

X ———— $3x+5$ — Y ——— $4x$ — Z

4. $LM= $ __33__

$6x+4$

K — 7 — L ——— $5x+3$ — M

5. Given the diagram for the right, which of the following is true?

a) $x = 5$

b) $x = -5$

c) $AB = 20$

d) $BC = 23$

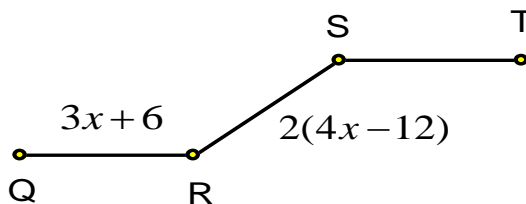**e)** None of the above

A ——— $x+15$ ——— B — $2x+13$ — C

13
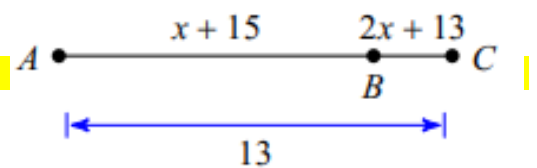
Suppose M is between L and N. ML= 3x + 10, MN= 75 – 10x, and LN= 50. Find the length of each segment.

7. ML = $\quad$ 25

8. MN = $\quad$ 25

9. **Given:** $\overline{ST} \cong \overline{SR}, \overline{QR} \cong \overline{SR}$ **Solve for x.**

$3x+6$

$2(4x-12)$

$x = 6$

Q   R   S   T

10. Given: $\overline{XY} \cong \overline{YZ}, \overline{WX} \cong \overline{XY}$, **find XY**

X   Y

$5x - 16$ $3(x + 12)$

$XY = 114$

W   Z
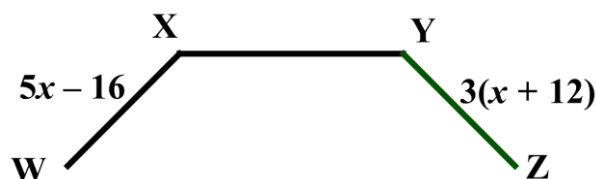
Mixed Review: Determine if the following are true or false.

11. *R, S,* and *T* are collinear.

False

12. There is only one plane that contains all the points R, S, and Q.

True

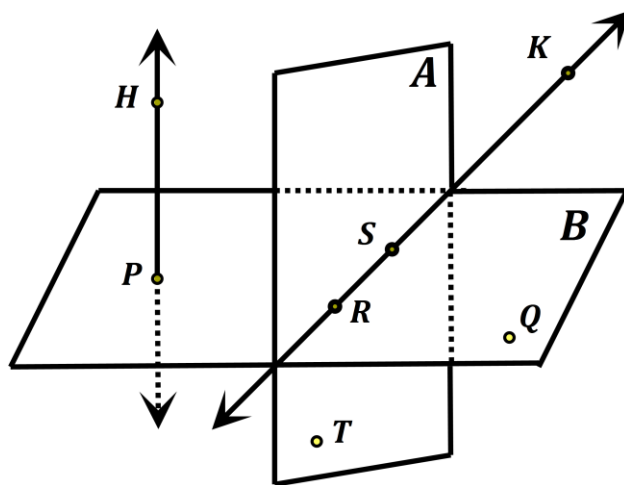**13.** Plane *A* and plane TRS are the same plane.

True

14. Plane *B* contains $\overleftrightarrow{PH}$

False

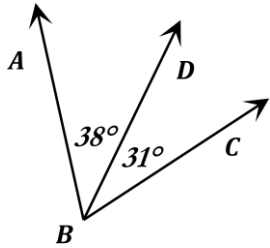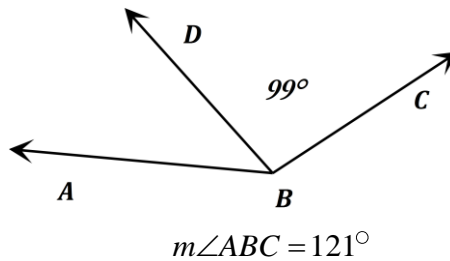**15.** Points *R, S,* and *K* make a plane.

False

H   A   K

S   B

P   R   Q

T

Geometry Unit 2 - Day 5 - Angle Addition Postulate

Find the following for each example.

1. $m\angle ABC =$ ___69°___

2. $m\angle ABD =$ ___22°___

3. $m\angle EBC =$ ___142°___

$m\angle ABC = 121°$
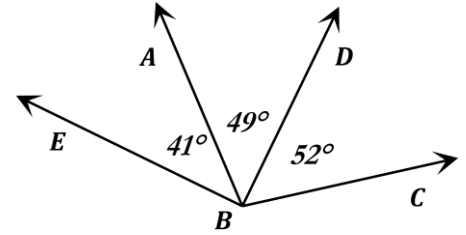
Use the diagram to the right for the following.

$m\angle RXT = 82$

$m\angle UXS = 70$

$m\angle TXV = 50$

4. $m\angle 1 =$ ___44°___

5. $m\angle TXU =$ ___32°___

6. $m\angle VXU =$ ___18°___

7. $m\angle RXU =$ ___114°___

8. $m\angle VXS =$ ___88°___
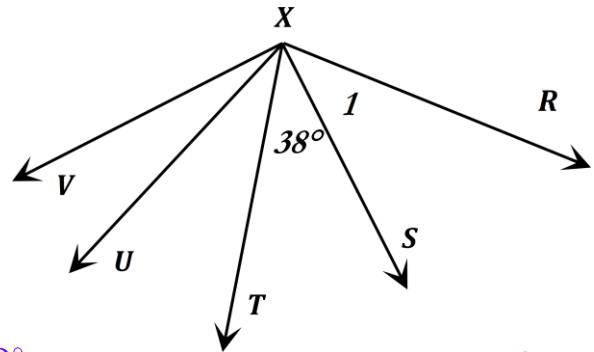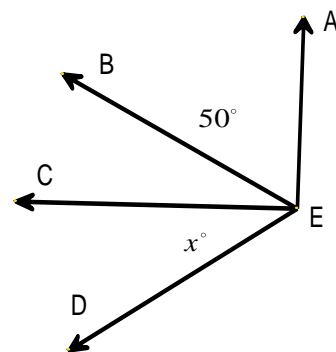
9. $m\angle RXV =$ ___132°___

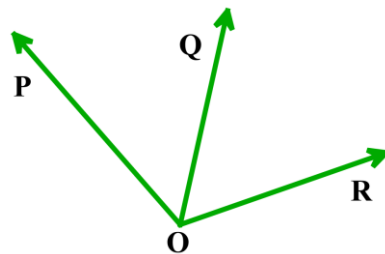**10.** Given: $m\angle DEA = 170$, , $\angle DEC \cong \angle CEB$. Find $m\angle CEB$

$$x = 60$$

$$m\angle CEB = 60°$$

11. Let Q be in the interior of $\angle POR$. $m\angle POQ = x+4$, $m\angle QOR = 2x-2$, and $m\angle POR = 26$. Find the value of x, and $m\angle QOR$ (Hint: draw a picture first).

$$x = 8$$

$$m\angle QOR = 14°$$

12. Let W be in the interior of $\angle XYZ$. $m\angle XYZ = 180°$, $m\angle XYW = (a+1)°$ and $m\angle WYZ = (5a-13)°$ Which of the following are true statements (select all that apply).

a) $a = \frac{7}{2}$

b) $a = 5$

c) $a = 32$

d) $m\angle XYW = 33°$

e) $m\angle XYW = 6°$
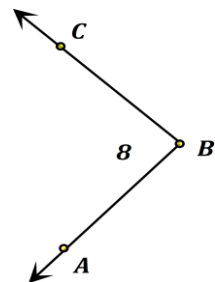
f) $m\angle WYZ = 147°$

g) $m\angle WYZ = 12°$

MIXED Review:

Name each angle in four ways. Then identify its vertex and its sides.
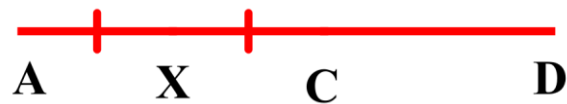
13. $\angle ABC, \angle CBA, \angle B, \angle 8$ **Sides:** $\overrightarrow{BA}, \overrightarrow{BC}$

Vertex: B

14. X is between A and C and C is between X and D. If $AX = XC$, $AD = 42$, and $CD = 16$, find the length of AX. *Hint: Draw the picture and label the lengths.*
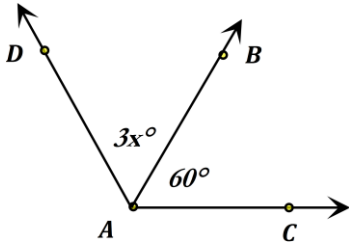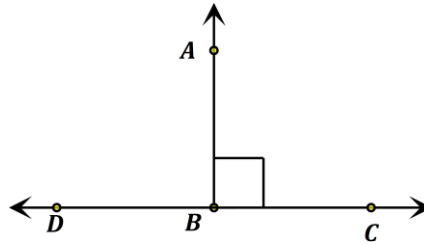
$AX = 13$

A   X   C   D

Geometry Unit 2 - Day 6 – Vertical Bisectors

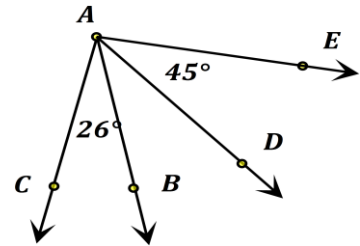**For 1 – 5, AB is an angle bisector. Find the following.**

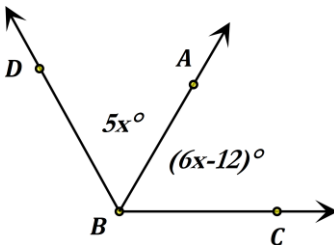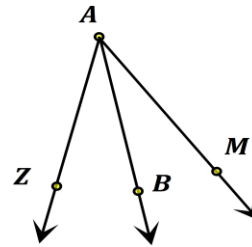**1.** $x =$ _____20_____

2. $m\angle ABD =$ _____90_____

3. $m\angle DAB =$ _____26_____

4. $m\angle CBA =$ _____60_____
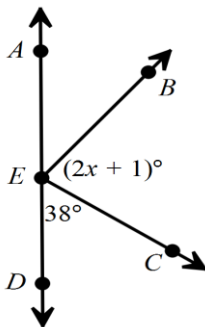
5. $m\angle ZAB =$ _____32_____ if $m\angle ZAM = 2b - 4, m\angle BAM = 2b - 36$.

For 6 – 7, $\overrightarrow{EB}$ is the angle bisector of $\angle AEC$.
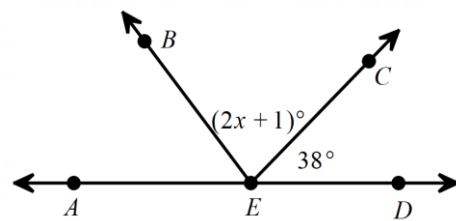
6. Find $m\angle BEC$.

7. Find x

a) $m\angle BEC = 18.5°$

b) $m\angle BEC = 19°$

c) $m\angle BEC = 38°$

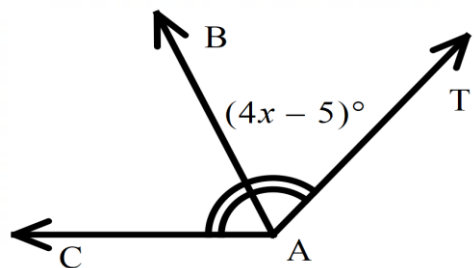**d)** $m\angle BEC = 71°$

a) $x = 35$

b) $x = 51.5$

c) $x = 70.5$

d) $x = 142$

8. Find the value that would make $\overrightarrow{AB}$ an angle bisector of $\angle CAT$ and $m\angle CAT = 150°$.

$$x = 20$$

(diagram: rays from A with B, T, C; angle $(4x-5)°$)

For 9 – 12, decide if the following are true or false. If they are false, explain why.

9. Every angle has exactly one angle bisector.

True

10. You can assume a ray is an angle bisector.

False

11. If two angles are congruent, then they share an angle bisector.

False

12. Straight angles cannot have an angle bisector.

False

Mixed Review: Use the diagram for the following

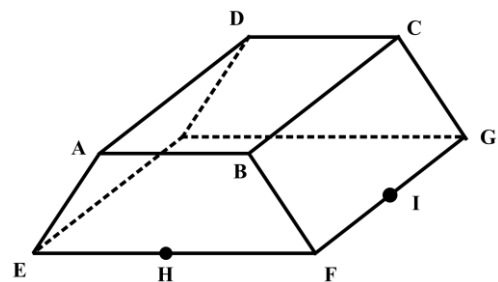**13.** Name three collinear points.

E, H, F

F, I, G

14. Name three non-collinear points.

Various

$A, B, E \ \ or \ \ B, C, G$

15. Name a point that is coplanar with points B, C and F.

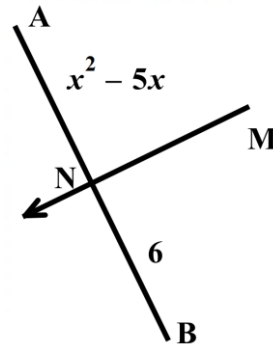$G \ or \ I$

Geometry Unit 2 - Day 7 – Segment Bisectors

For 1 – 2, $\overrightarrow{MN}$ is a segment bisector of $\overline{AB}$.

1. Find x

$$x = 6 \quad \& \quad x = -1$$

2. Find AB

$$AB = 12$$

A

$x^2 - 5x$

M

N

6

B

For 3 and 4, $\overleftrightarrow{EF}$ is a segment bisector of $\overline{ST}$. Solve for x.

3. Find x

$$x = 8 \quad \& \quad x = -7$$

4. Find US

$$US = 56$$

F

U   56

S

$x^2 - x$ T

E
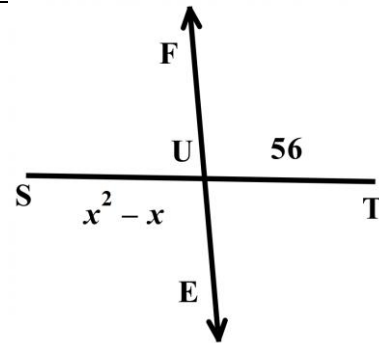
5. What value(s) of x would make $\overline{CW}$ a segment bisector of $\overline{AB}$

$$x = -2 \quad \& \quad x = 6$$

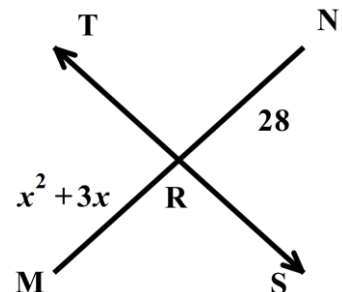A   W

$x^2 - 4x$

N   12

C   B
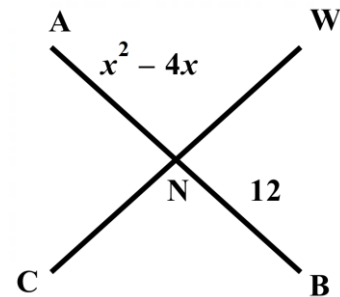
6. What value of x would make $\overline{TS}$ a segment bisector of $\overline{MN}$

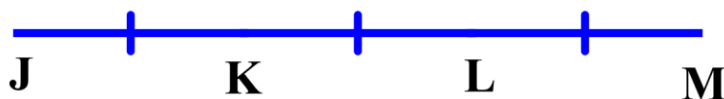**a)** $x = -4$

b) $x = 4$

c) $x = 7$

d) $x = 11$

T   N

28

$x^2 + 3x$ R

M   S

Mixed Review:

7. How many points make a plane (select **all** that are true)?

    a) Just 1 point is needed

    b) Any 2 points

    c) 3 collinear points

    d) 3 non-colinear points

    e) 4 non-collinear points

    f) 4 collinear points

For 8 – 10 all use the same diagram.

8. Draw a picture to illustrate the following: K is in between J and M, and L is in between K and M, and $\overline{JK} \cong \overline{KL} \cong \overline{LM}$
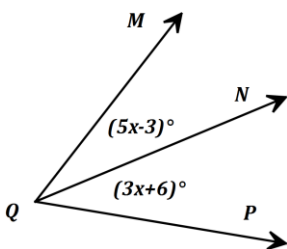

J   K   L   M

9. Find JK if $JM = 21$

$$x = 7$$

10. Find MK

$$MK = 14$$

11. Find the $m\angle PQM = 67^{o}$, find $m\angle MQN$

M

N

(5x-3)°

(3x+6)°

Q   P

$$m\angle MQN = 37°$$

12. How do you label the following ray?

S   T

$$\overrightarrow{TS}$$

Geometry Unit 2 - Day 8 – Putting it All Together

For 1 and 2, assume that Y is in between X and Z. $XY = 2n - 8$, $YZ = 4n - 9$, and $XZ = 10$.

1. Find n $\qquad n = 4.5$

2. Find XY $\qquad XY = 1$

For 3 – 4, suppose that M is in between L and N. $ML = 3x + 10$, $MN = 75 - 10x$, and $LN = 50$.

3. Find x $\qquad x = 5$

4. Find ML $\qquad ML = 25$

For 5 – 6, use the given information. G is in between A and B, $\overline{AG} \cong \overline{GB}$, $AG = x^2 - 4x$, $GB = 3x - 6$, and $AB = 24$.

5. Find x $\qquad x = 6$

6. Find AG $\qquad AG = 12$

For 7 – 8, let Q be in the interior of $\angle POR$. $m\angle POQ = (x + 4)°$, $m\angle QOR = (2x - 2)°$, and $m\angle POR = 26°$. Find the following.

7. Find x $\qquad x = 8$

8. $m\angle QOR$ $\qquad m\angle QOR = 14°$

For 10 – 11, _D_ is in the interior of ∠_ABC_. ∠_ABC_ is a right angle, $m\angle ABD = (45 - 7x)°$, $m\angle DBC = (25 + 3x)°$. Find the following.

9. Find x

$$x = -5$$

10. $m\angle DBC$ $m\angle DBC = 10°$

For 11 – 12, _K_ is between _J_ and _L_. If $JK = x^2 - 4x$, $KL = 3x - 2$, and $JL = 28$. Find the following.

11. JK $JK = 12$

12. KL $KL = 16$

13. _D_ is in the interior of ∠_ABC_. $\overrightarrow{BD}$ is an angle bisector of ∠_ABC_. $m\angle ABD = (x^2 - 5x)°$ and $m\angle DBC = (5x - 9)°$. Find $m\angle ABC$.

a) $m\angle ABC = 9°$

b) $m\angle ABC = 18°$

c) $m\angle ABC = 36°$

d) $m\angle ABC = 72°$

14. _X_ is in between _A_ and _C_. _C_ is in between _X_ and _D_. If $AX = XC$, $AD = 42$, and $CD = 16$. Which of the following is the length of _AX_?
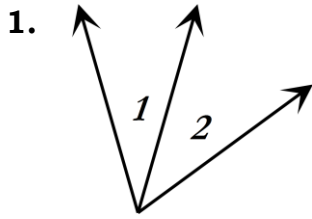
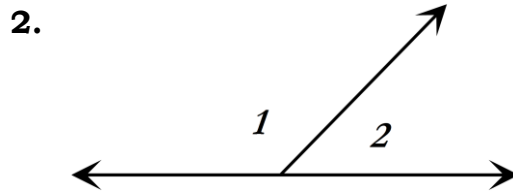a) $XY = 11$

b) $XY = 12$

c) $XY = 13$

d) $XY = 14$

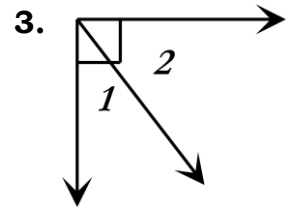e) None of the above

Geometry Unit 2 - Day 9 - Angle Relationships

Describe the relationship of angles 1 and 2 in as many ways as possible using Supplementary, Complementary, Linear Pair, and/or Adjacent Angles.
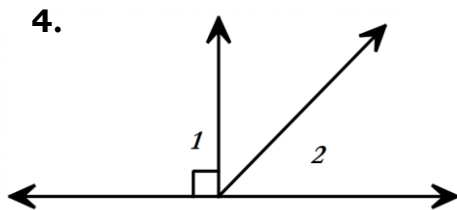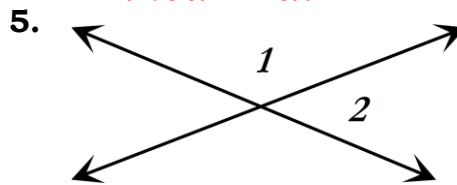
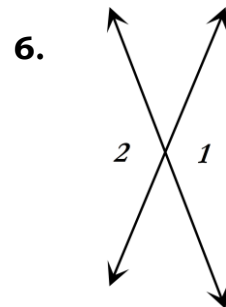**1.**

Adjacent

2.

Adjacent

Supplementary

Linear Pair

3.

Complementary

4.

None

5.

Adjacent

Supplementary

Linear Pair

6.

None

For 7 – 10, use the diagram to the right.

7. Which angle forms a linear pair with $\angle AGF$?

$\angle FGD$

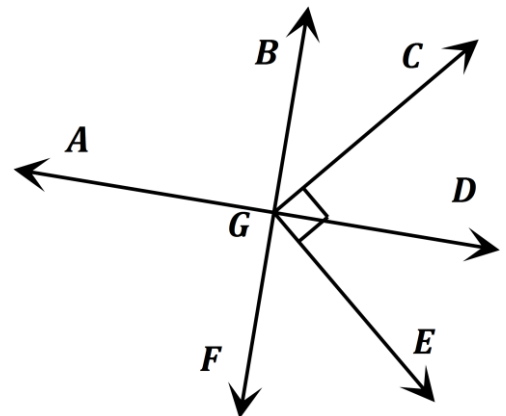**8.** Name two complementary angles.

$\angle CGD$ & $\angle EGD$

9. Name an angle that is supplementary to $\angle CGD$.

$\angle CGA$

10. Which angle forms a linear pair with $\angle BGE$?

$\angle EGF$

11. Assuming that $\angle A$ is supp. to $\angle B$. Fill in the following.

$m\angle A$	$62°$	$118°$	$3°$
$m\angle B$	$118°$	$62°$	$117°$

12. Assuming that $\angle A$ is comp. to $\angle B$. Fill in the following.

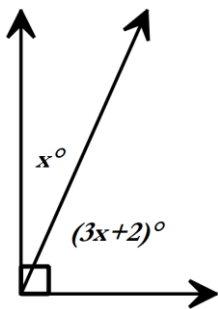| $m\angle A$	$62°$	$78°$	$3°$
$m\angle B$	$28°$	$12°$	$87°$

13. What is the measure of an angle that is supplementary to $\angle HIJ$ if $m\angle HIJ = 54°$?

$$126°$$

14. What is the measure of an angle that is complementary to $\angle DEF$ if $m\angle DEF = 74°$?

$$16°$$

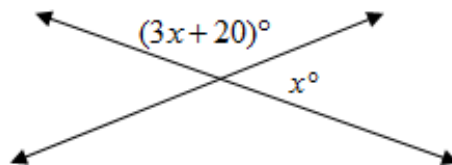**15.** Find the value of x

$x°$

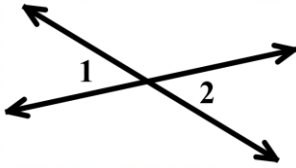$(3x+2)°$

$$x = 22$$

16. Find the value of x

$(3x+20)°$

$x°$

$$x = 40$$

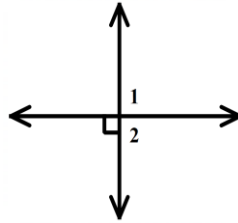# Geometry Unit 2 - Day 10 Vertical Angles and Linear Pairs-

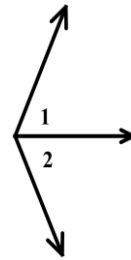**Determine ∠1 and ∠2 are linear pair, vertical angles, or neither.**
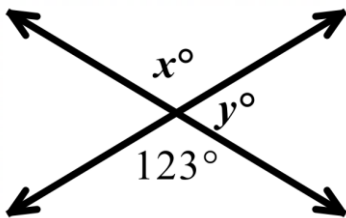
1.

Vertical Angles

2.

Linear Pair

3.

neither
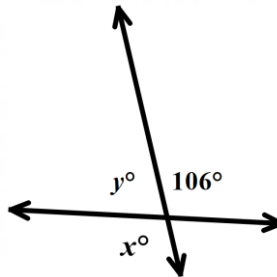
Solve for the following variables.

3.

x°

y°

123°

$x = 123^\circ$

$y = 57^\circ$

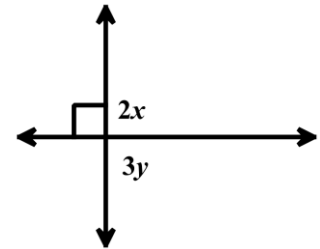**4.**

y° 106°

x°

$x = 106^\circ$

$y = 74^\circ$

5.

$2x$

$3y$

$x = 45^\circ$

$y = 30^\circ$

6. Given the diagram to the right, which of the following are true (select <u>all</u> that are true)?
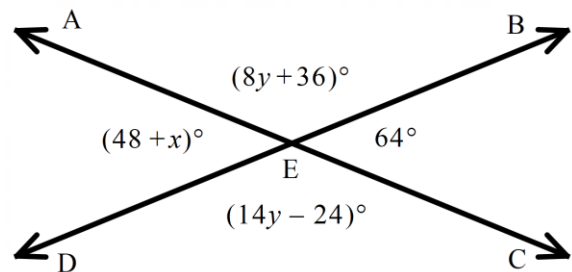
a) $x = 10$

b) $y = 10$

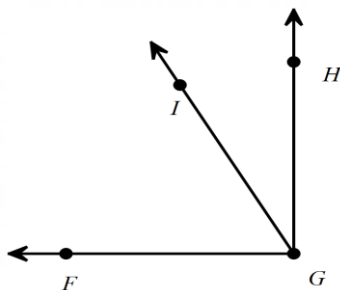**c)** $x = 16$

d) $y = 16$

e) $m\angle AED = 64^\circ$

f) $m\angle AEB = 64^\circ$

g) $m\angle AED = 116^\circ$

h) $m\angle DEC = 116^\circ$

A   B

$(8y+36)^\circ$

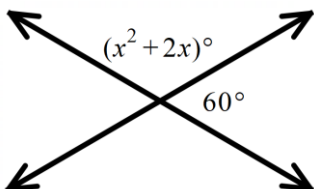$(48 + x)^\circ$ 64°

E

$(14y - 24)^\circ$

D   C

7. In the figure $\overrightarrow{GF} \perp \overrightarrow{GH}$, $m\angle FGI = (8x)°$, and $m\angle HGI = (2x-20)°$. Find $m\angle FGI$ and $m\angle HGI$.

$$m\angle FGI = 88°$$

$$m\angle HGI = 2°$$

8. Find the value(s) of x
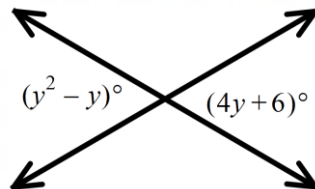

$(x^2+2x)°$

$60°$

$$x = -12$$

$$x = 10$$

9. Find the value(s) of y

$(y^2-y)°$ $(4y+6)°$

$$y = -1$$

$$y = 6$$

10. Find the value of the variables.
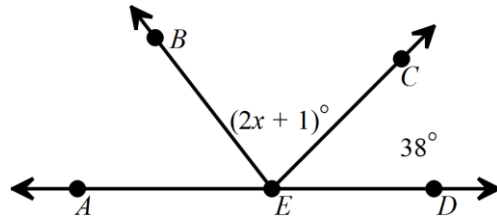

$(2y+50)°$ $(7x-248)°$

$(5y-17)°$ $(x+44)°$

$$y = 21$$

$$x = 48$$
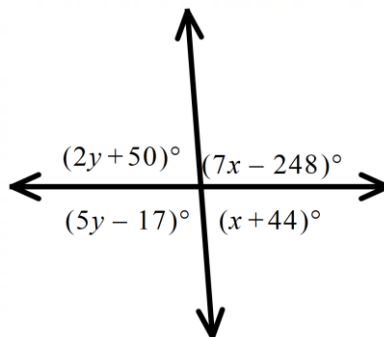
11. $\overrightarrow{EB}$ is the angle bisector of $\angle AEC$. What is the value of x?

    A. $x = 35$

    B. $x = 51.5$

    C. $x = 70.5$

    D. $x = 142$

$(2x + 1)°$

$38°$

12. Given the information below, find BC.
- B is between A and C
- $AC = 2x + 8$
- $AB = 4x - 16$
- $BC = 3x - 6$

    A. $BC = 6$ **C.** $BC = 12$

    B. $BC = 8$ **D.** $BC = 20$