UNIT 1 DICTIONARY: GEOMETRY BASICS

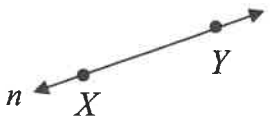
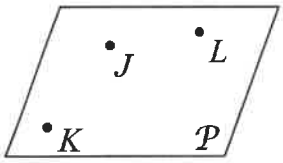
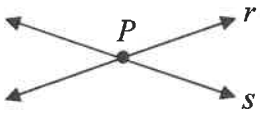
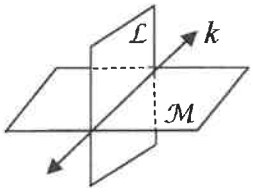
Term	Definition	Example or Visual
POINT		
LINE		
LINE SEGMENT		
RAY		
PLANE		
COLLINEAR		
COPLANAR		

CONGRUENT SEGMENTS		
SEGMENT ADDITION POSTULATE		
DISTANCE FORMULA		
MIDPOINT FORMULA		
SEGMENT BISECTOR		
DIRECTED LINE SEGMENT		
HORIZONTAL COMPONENT		
VERTICAL COMPONENT		

PERPENDICULAR		
PERPENDICULAR BISECTOR		
PARALLEL LINES		
ANGLE		
VERTEX		
RIGHT ANGLE		
ACUTE ANGLE		
OBTUSE ANGLE		
STRAIGHT ANGLE		

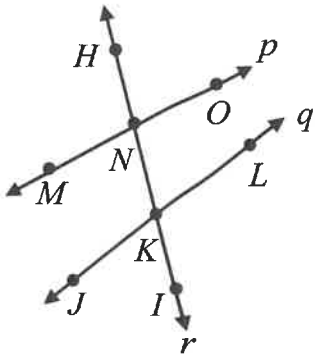
CONGRUENT ANGLES		
ADJACENT ANGLES		
ANGLE ADDITION POSTULATE		
ANGLE BISECTOR		
VERTICAL ANGLES		
COMPLEMENTARY ANGLES		
SUPPLEMENTARY ANGLES		
LINEAR PAIR		

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes
POINT • A	• A point is a _____. • It has no _____ or _____. • Always use a CAPITAL LETTER to name a point. **Example:** _____
LINE 	• A line is made up of _____. • Any _____ points form a line. • A line has no _____ or _____. • Name a line by any two points on the line, or a lowercase script letter. **Example:** _____ • **COLLINEAR POINTS:** Points that lie on the same line. • **NON-COLLINEAR POINTS:** Points that do NOT lie on the same line. **(Must be at least three points!)**
PLANE 	• A plane is a _____ _____ made up of points. • Any _____ points make up a plane. • A plane extends indefinitely in all directions. • Name a plane by any three non-collinear points on the plane, or an uppercase script letter. **Example:** _____ • **COPLANAR POINTS:** Points that line on the same plane. • **NON-COPLANAR POINTS:** Points that do NOT lie on the same plane. **(Must be at least four points!)**
Intersecting LINES & PLANES	 **Two lines intersect at a _____!**  **Two planes intersect at a _____!**

Naming Points, Lines, and Planes: Practice!

1. Use the diagram to the right to name the following.



a) Four collinear points. _____

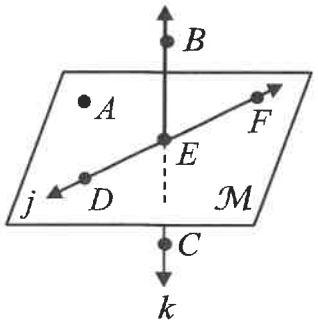
b) A line that contains point M. _____

c) A line that contains points H and K. _____

d) Another name for line q. _____

e) The intersection of lines p and r. _____

2. Use the diagram to the right to name the following.



a) A line containing point F. _____

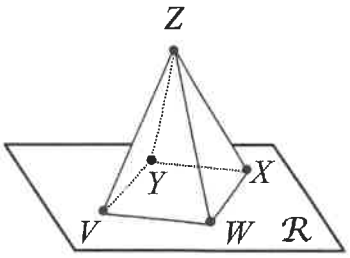
b) Another name for line k. _____

c) A plane containing point A. _____

d) An example of three non-collinear points. _____

e) The intersection of plane M and line k. _____

3. Use the diagram to the right to name the following.



a) Three coplanar points. _____

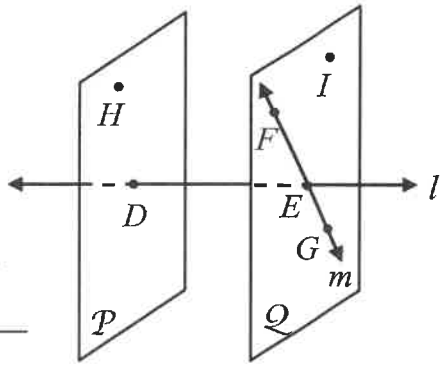
b) A plane containing point X. _____

c) The intersection of plane R and plane ZVY. _____

d) How many planes appear in the figure? _____

e) How many planes contain point W? _____

4. Use the diagram to the right to name the following.



a) The intersection of lines l and m. _____

b) Another name for plane $\mathcal{Q}$. _____

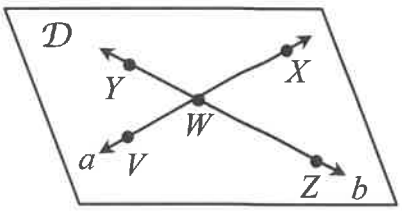
c) Are points D and E collinear or coplanar? _____

d) How many times do planes $\mathcal{P}$ and $\mathcal{Q}$ intersect? _____

Name: _____ **Unit 1:** Geometry Basics

Date: _____ **Per:** _____ **Homework 1:** Points, Lines, and Planes

1. Use the diagram to answer the following questions.



a) How many points appear in the figure? _____

b) How many lines appear in the figure? _____

c) How many planes appear in the figure? _____

d) Name a line containing point V. _____

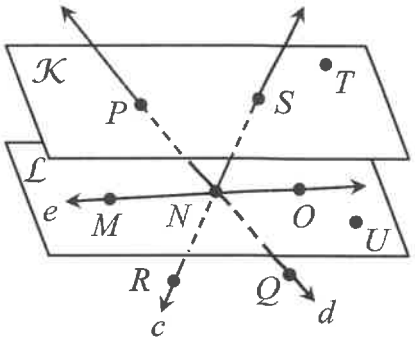
e) Name the intersection of lines a and b. _____

f) Give another name for line b. _____

g) Name three non-collinear points. _____

h) Give another name for plane $\mathcal{D}$. _____

2. Use the diagram to answer the following questions.



a) How many points appear in the figure? _____

b) How many lines appear in the figure? _____

c) How many planes appear in the figure? _____

d) Name three collinear points. _____

e) Name four non-coplanar points. _____

f) Give another name for line e. _____

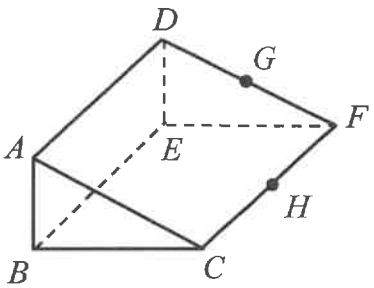
g) Name the intersection of $\overleftrightarrow{PQ}$ and $\overleftrightarrow{MO}$. _____

h) Name the intersection of plane K and line c. _____

i) Give another name for plane L. _____

j) Give another name for $\overleftrightarrow{PQ}$. _____

3. Use the diagram to answer the following questions.



a) How many points appear in the figure? _____

b) How many lines appear in the figure? _____

c) How many planes appear in the figure? _____

d) Name three collinear points. _____

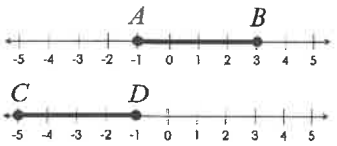
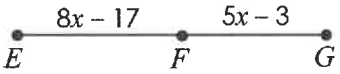
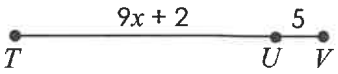
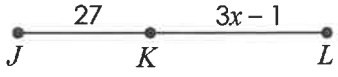
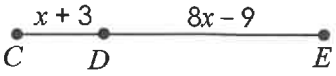
e) Name four coplanar points. _____

f) Name the intersection of planes ABC and ABE. _____

g) Name the intersection of planes BCH and DEF. _____

h) Name the intersection of $\overline{AD}$ and $\overline{DF}$. _____

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples	
MEASURING SEGMENTS	The distance between two points A and B be written as _____ or _____.	 $AB =$ _____
CONGRUENT SEGMENTS	If _____, then the segments are congruent. This is written as _____.	
SEGMENT ADDITION *Postulate*	If A, B, and C, are collinear points and B is between A and C, then _____	
Examples	**Use the diagram below for questions 1 and 2.** 	**1.** If $PQ = 9$ and $QR = 28$, find PR.
		2. If $QR = 17$ and $PR = 21$, find PQ.
	3. If $EG = 71$, find the value of x. 	**4.** If $TV = 14x - 8$, find TU. 
	5. If $JL = 5x + 2$, find JL. 	**6.** If $CE = 7x + 4$, find the value of x. 

7. If $SK = 13x - 5$, $KY = 2x + 9$, and $SY = 36 - x$, find each value.

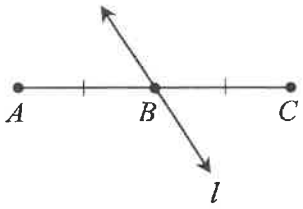
$x =$ _____

$SK =$ _____

$KY =$ _____

$SY =$ _____

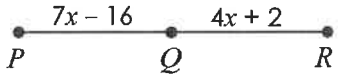
MIDPOINT *of a Segment*



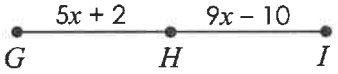
- The _____ of a segment is a point that divides the segment into _____ _____ _____.
- A line, ray, or segment that intersects a segment at its midpoint is said to _____ the segment and is called the _____ _____.
- In the diagram to the left, _____ is the midpoint of _____ and line _____ is a _____ _____ of _____.

Examples

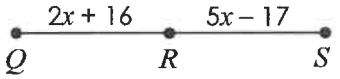
8. If Q is the midpoint of $\overline{PR}$, find the value of x.



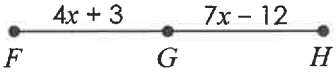
9. If H is the midpoint of $\overline{GI}$, find GH.



10. If R is the midpoint of $\overline{QS}$, find QS.



11. If G is the midpoint of $\overline{FH}$ and $FH = 6y - 2$, find y.



Name: _____ **Unit 1:** Geometry Basics

Date: _____ **Per:** _____ **Homework 2:** Segment Addition Postulate

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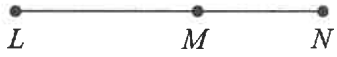
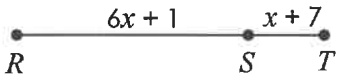
Use the diagram below to answer questions 1 and 2.



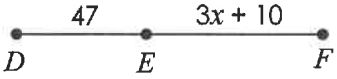
1. If $LM = 22$ and $MN = 15$, find LN.

2. If $LN = 54$ and $LM = 31$, find MN.

3. If $RT = 36$, find the value of x.

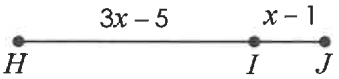


4. If $DF = 9x - 39$, find EF.



5. If $UW = 6x - 35$, find UW.

6. If $HJ = 7x - 27$, find the value of x.



7. If $BD = 7x - 10$, $BC = 4x - 29$, and $CD = 5x - 9$, find each value.

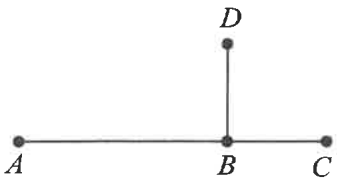
$x =$ _____

$BC =$ _____

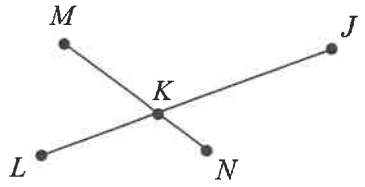
$CD =$ _____

$BD =$ _____

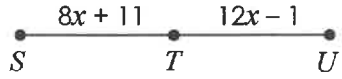
8. If $\overline{BD} \cong \overline{BC}$, $BD = 5x - 26$, $BC = 2x + 1$, and $AC = 43$, find AB.



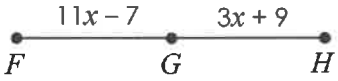
9. If $\overline{LK} \cong \overline{MK}$, $LK = 7x - 10$, $KN = x + 3$, $MN = 9x - 11$, and $KJ = 28$, find LJ.



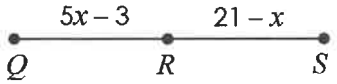
10. If T is the midpoint of $\overline{SU}$, find x.



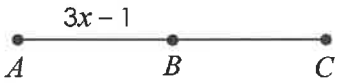
11. If G is the midpoint of $\overline{FH}$, find FG.



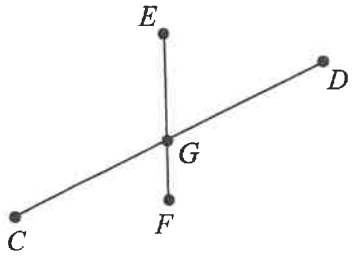
12. If R is the midpoint of $\overline{QS}$, find QS.



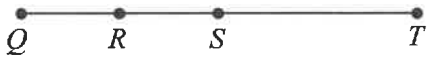
13. If B is the midpoint of $\overline{AC}$, and $AC = 8x - 20$, find BC.



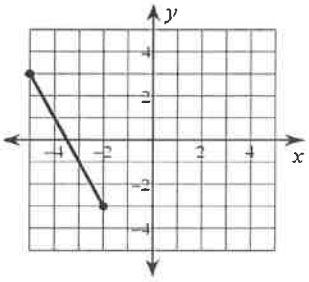
14. If $\overline{EF}$ bisects $\overline{CD}$, $CG = 5x - 1$, $GD = 7x - 13$, $EF = 6x - 4$, and $GF = 13$, find EG.



15. If R is the midpoint of $\overline{QS}$, $RS = 2x - 4$, $ST = 4x - 1$, and $RT = 8x - 43$, find QS.



Name:	Class:
Topic:	Date:

Main Ideas/Questions	Notes
Distance Formula	Used to find the distance between two points (x_1, y_1) and (x_2, y_2)
	Formula:
Examples	**1.** Find the distance between the two points on the graph. 
	2. Find AB given $A(-4, 1)$ and $B(3, -1)$.
	3. Find EF given $E(-7, -2)$ and $F(11, 3)$
Midpoint Formula	Used to find the midpoint between two points (x_1, y_1) and (x_2, y_2)
	Formula:
	4. Find the midpoint of $\overline{GH}$ given $G(7, -5)$ and $H(9, -1)$.
	5. Find the midpoint of $\overline{AB}$ given A(-7, 4) and B(3, -4).

Finding a Missing Endpoint

6. Find the coordinates of A if $M(-1, 2)$ is the midpoint of $\overline{AB}$ and B has coordinates of (3, -5).

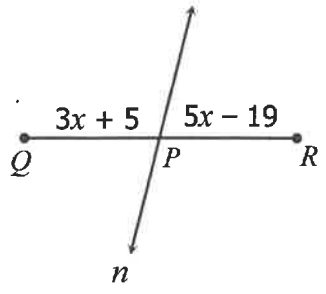
7. Find the coordinates of J if $K(-5, 10)$ is the midpoint of $\overline{JL}$ and L has coordinates of (-8, 6).

8. Find the coordinates of R if $Q(-1, 3)$ is the midpoint of $\overline{PR}$ and P has coordinates of (5, 6).

More Practice with Algebra

9. If P is the midpoint of $\overline{XY}$, $XP = 8x - 2$, and $PY = 12x - 30$, find the value of x.

10. If G is the midpoint of $\overline{FH}$, $FG = 14x + 25$, and $GH = 73 - 2x$, find FH.



11. Using the diagram to the left, if line n bisects $\overline{QR}$, find QP.

Name: _____ **Unit 1:** Geometry Basics

Date: _____ **Per:** _____ **Homework 3:** Distance & Midpoint Formulas

**** This is a 2-page document! ****

Directions: Find the distance between each pair of points.

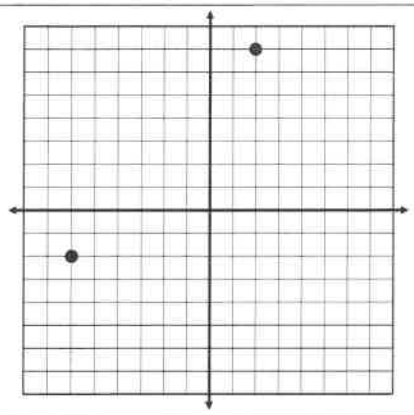
1. (-4, 6) and (3, -7)

2. (-6, -5) and (2, 0)

3. (-1, 4) and (1, -1)

4. (0, -8) and (3, 2)

5.



Directions: Find the coordinates of the midpoint of the segment given its endpoints.

6. $A(5, 8)$ and $B(-1, -4)$

7. $M(-5, 9)$ and $N(-2, 7)$

8. $P(-3, -7)$ and $Q(3, -5)$

9. $F(2, -6)$ and $G(-8, 5)$

Directions: Find the missing endpoint if S is the midpoint $\overline{RT}$.

10. $R(-9, 4)$ and $S(2, -1)$; Find T.

11. $S(-4, -6)$ and $T(-7, -3)$; Find R.

12. B is the midpoint of $\overline{AC}$ and E is the midpoint of $\overline{BD}$. If $A(-9, -4)$, $C(-1, 6)$, and $E(-4, -3)$, find the coordinates of D.

Directions: Suppose Q is the midpoint of $\overline{PR}$. Use the information to find the missing value.

13. $PQ = 3x + 14$ and $QR = 7x - 10$; Find x.

14. $PQ = 2x + 1$ and $QR = 5x - 44$; Find PQ.

15. $PQ = 6x + 25$ and $QR = 16 - 3x$; Find PR.

16. $PR = 9x - 31$ and $QR = 43$; Find x.

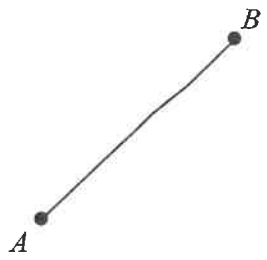
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Directed LINE SEGMENT

Given the directed line segment $\overline{AB}$:

- Point A is the _____ point with coordinates _____.
- Point B is the _____ point with coordinates _____.



HORIZONTAL & VERTICAL Components

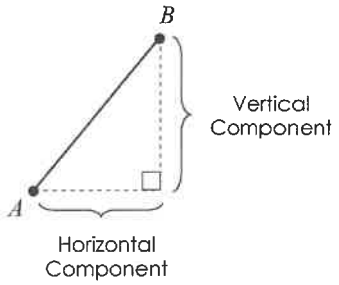
A directed segment has a horizontal component (called the run) and a vertical component (called the rise). The components are defined as:

Horizontal Component (Run):

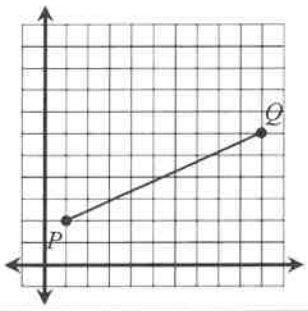
_____

Vertical Component (Rise):

_____



1. Find the horizontal and vertical components of directed line segment $\overline{PQ}$ to the left.



2. Find the horizontal and vertical components of directed line segment $\overline{CD}$ with coordinates $C(-2, 6)$ and $D(1, -1)$.

PARTITIONING a Segment

- To partition means to _____ or _____.
- We can partition a line segment into smaller segments and compare their lengths as a _____.

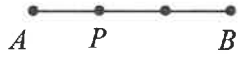
3. If $\overline{AB}$ is partitioned into five congruent parts, give each ratio:

***AP* to *PB*:** _____
(part to part)

***AP* to *AB*:** _____
(part to whole)

Assume the segments are partitioned into congruent parts, identify each ratio.

4.



a) AP to PB

b) AP to AB

5.

a) AP to PB

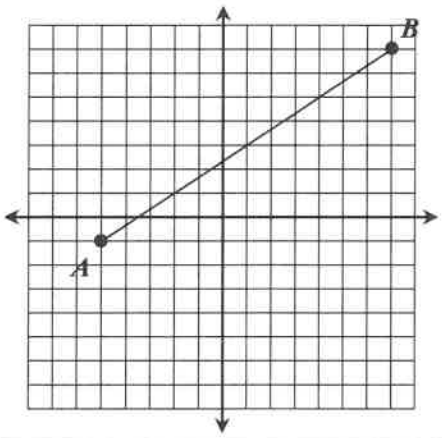
b) AP to AB

FINDING Coordinates

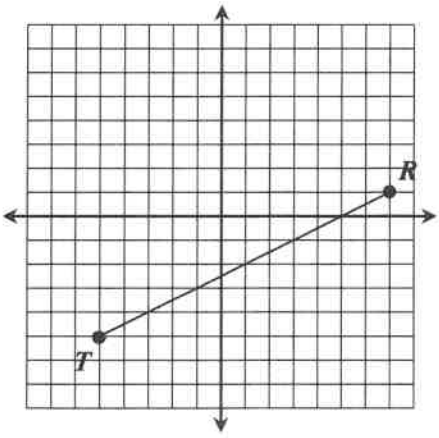
What if we want to find the coordinates of a point that partitions a directed line segment into a given ratio? Follow the steps below.

1. Write the ratio as a **part to whole** in fraction form.
2. Multiply the horizontal component (run) by the ratio found in Step 1, then add this value to the x-coordinate of the initial point, x_1. This is the x-coordinate of the point.
3. Multiply the vertical component (rise) by the ratio found in Step 1, then add this value to the y-coordinate of the initial point, y_1. This is the y-coordinate of the point.

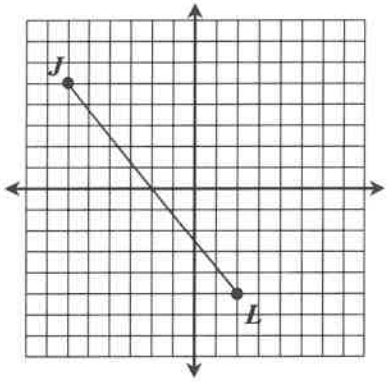
6. Given directed line segment $\overline{AB}$ below, find the coordinates of P such that the ratio of AP to PB is 1:3. Plot point P.



7. Given directed line segment $\overline{RT}$ below, find the coordinates of S such that the ratio of RS to ST is 5:1. Plot point S.



8. Given directed line segment $\overline{JL}$ below, find the coordinates of K such that the ratio of JK to JL is 7:8. Plot point K.



Partitioning a Segment FORMULA

Given a directed line segment $\overline{AB}$ with coordinates $A(x_1, y_1)$ and $B(x_2, y_2)$, if point P partitions AB such that the ratio of AP to AB is k, then the coordinates of P are:

***Important:** The ratio must be written as a part to whole in fraction form!

MORE EXAMPLES

9. Given $\overline{AB}$ with $A(3, -1)$ and $B(8, 14)$, if P lies on $\overline{AB}$ such that the ratio of AP to PB is 2:3, find the coordinates of P.

10. Given $\overline{MP}$ with $M(-12, -5)$ and $P(9, -12)$, if N lies on $\overline{MP}$ such that the ratio of MN to NP is 3:4, find the coordinates of N.

11. Given $\overline{XZ}$ with $X(1, 9)$ and $Z(5, -11)$, if Y lies on $\overline{XZ}$ such that the ratio of XY to XZ is 1:4, find the coordinates of Y.

12. Given $\overline{PR}$ with $P(-6, -6)$ and $R(-2, 10)$, if Q lies on $\overline{PR}$ such that the ratio of PQ to PR is 5:8, find the coordinates of Q.

13. Given $\overline{GH}$ with $G(-8, 8)$ and $H(7, 2)$, if point P divides GH one-third of the way from G to H, find the coordinates of P.

14. Given $\overline{AC}$ with $A(4, -7)$ and $C(-4, 11)$, if point B divides AC five-sixths of the way from A to C, find the coordinates of B.

APPLICATIONS

15. In a certain town, the mall is located 1 mile west and 8 miles north of the post office. The library is located 5 miles east and 2 miles north of the post office. If Alana's house lies two-thirds of the way between the mall and the library, find the location of her home relative to the post office.

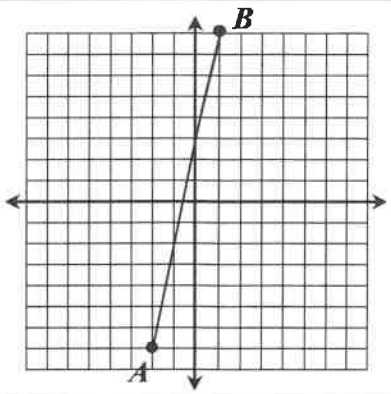
16. Two cruise ships left the same port. After two hours, Ship A is 30 miles west and 18 miles north of the port and Ship B is 10 miles west and 27 miles south of the port. If there is a tug boat located one-fifth of the way from Ship A to Ship B, find the location of the tug boat relative to the port.

Name: _____ **Unit 1:** Geometry Basics

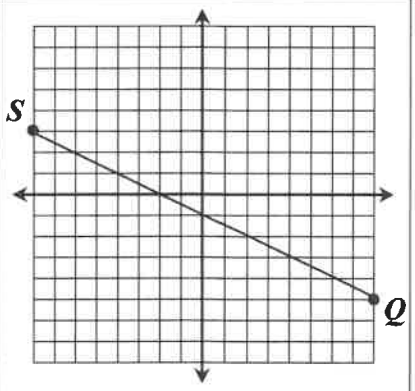
Date: _____ **Per:** _____ **Homework 4:** Partitioning a Segment

**** This is a 2-page document! ****

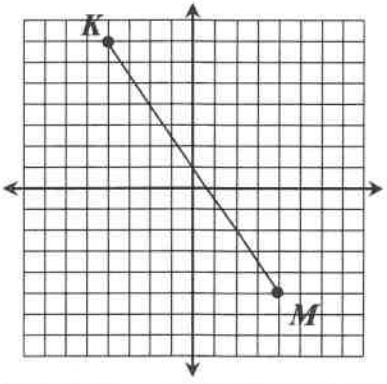
1. Given directed line segment $\overline{AB}$, find the coordinates of P such that the ratio of AP to PB is 2:1. Plot point P.



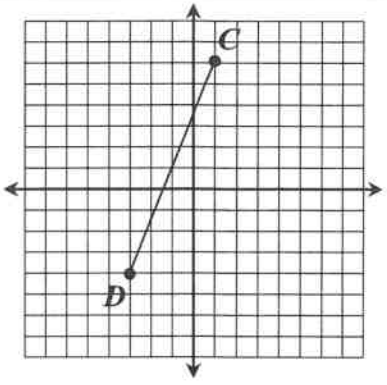
2. Given directed line segment $\overline{QS}$, find the coordinates of R such that the ratio of QR to RS is 3:5. Plot point R.



3. Given directed line segment $\overline{KM}$, find the coordinates of L such that the ratio of KL to KM is 1:3. Plot point L.



4. Given directed line segment $\overline{CD}$, if point E divides CD three-fourths of the way from C to D, find the coordinates of E, then plot E.



5. Given $\overline{AC}$ with $A(3, 4)$ and $C(-9, -2)$, if B partitions AC such that the ratio of AB to BC is 1:5, find the coordinates of B.

6. Given $\overline{WY}$ with $W(3, 7)$ and $Y(13, -8)$, if X partitions WY such that the ratio of WX to XY is 3:2, find the coordinates of X.

7. Given $\overline{DF}$ with $D(-1, 11)$ and $F(-9, -5)$, if E partitions DF such that the ratio of DE to DF is 5:8, find the coordinates of E.

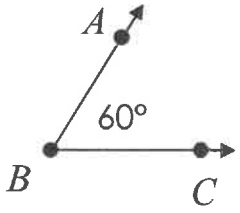
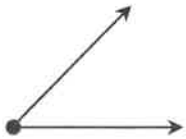
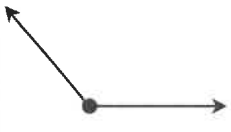
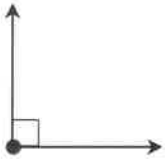
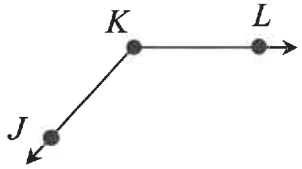
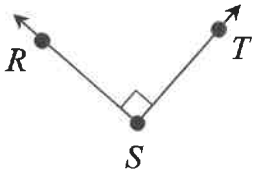
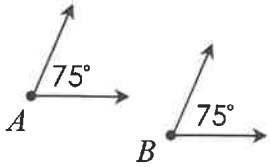
8. Given $\overline{AB}$ with $A(8, -4)$ and $B(-6, -11)$, if P partitions AB such that the ratio of AP to AB is 2:7, find the coordinates of P.

9. Given $\overline{XZ}$ with $X(-4, 3)$ and $Z(6, -2)$, find the coordinates of Y if Y divides XZ one-fifth of the way from X to Z.

10. Given $\overline{JL}$ with $J(8, -8)$ and $L(-16, -2)$, find the coordinates of K if K divides JL two-thirds of the way from J to L.

11. A ranger in a lookout tower spots two fires on the campground below. Fire A is 75 meters east and 40 meters south of the tower. Fire B is 37 meters west and 64 meters south of the tower. If there is a fire hydrant located three-fourths of the way from Fire A to Fire B, find the location of the fire hydrant relative to the tower.

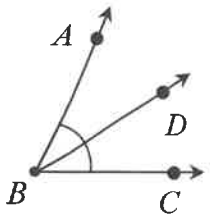
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes
Angles 	• An angle is formed by two _____ with a common endpoint. • This common endpoint is called the _____ • The rays are called the _____. • Name an angle using _____ letters. The middle letter must always represent the vertex! • Use a single letter if there is only one angle located at the vertex. • When referring to the measure of an angle, use a lowercase m. **Example:** $m\angle ABC = 60°$
types of Angles	  
Example 1 	**a)** Name the vertex of the angle. _____ **b)** Name the sides of the angle. _____ **c)** Give three ways to name the angle. _____, _____, _____ **d)** Classify the angle. _____
Example 2 	**a)** Name the vertex of the angle. _____ **b)** Name the sides of the angle. _____ **c)** Give three ways to name the angle. _____, _____, _____ **d)** Classify the angle. _____
Congruent Angles	If _____, then the angles are congruent. This is written as _____. 

Angle Bisector

A _____ that divides an angle into _____ _____ _____.

In the diagram to the right, _____ is an angle bisector, therefore, _____.

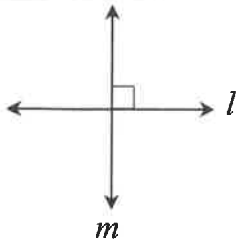


Perpendicular Lines

Two lines that _____ at a _____ _____.

The symbol for perpendicular is _____.

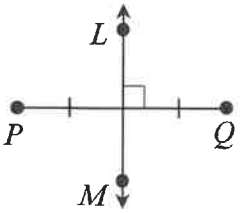
In the diagram to the right, _____.



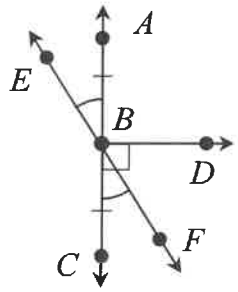
Perpendicular Bisector

A line, segment, or ray _____ to a segment at its _____.

In the diagram to the right, _____ is the perpendicular bisector to _____.



Example 3



a) Write another name for $\angle CBF$. _____

b) Name the sides of $\angle EBD$. _____

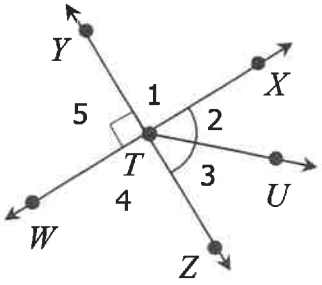
c) Classify $\angle ABC$. _____

d) Give an example of an obtuse angle. _____

e) Name two congruent angles. _____

f) Name a perpendicular bisector. _____

Example 4



a) Name the vertex of $\angle 2$. _____

b) Name the sides of $\angle 4$. _____

c) Write another name for $\angle 3$. _____

d) Write another name for $\angle 1$. _____

e) Classify $\angle YTW$. _____

f) Classify $\angle YTU$. _____

g) Classify $\angle XTU$. _____

h) Classify $\angle WTX$. _____

i) Name two perpendicular lines. _____

j) Name an angle bisector. _____

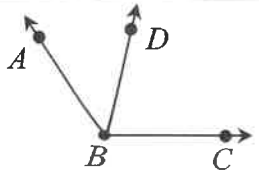
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

ANGLE ADDITION Postulate

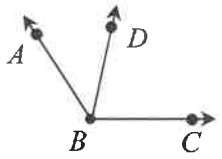
If D is in the interior of $\angle ABC$, then

_____



Examples

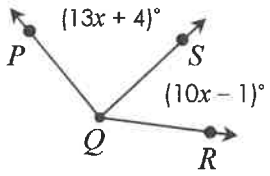
Use the diagram below to answer questions 1 and 2.



1. If $m\angle ABD = 48°$ and $m\angle DBC = 78°$, find $m\angle ABC$.

2. If $m\angle DBC = 74°$ and $m\angle ABC = 119°$, find $m\angle ABD$.

3. If $m\angle PQR = 141°$, find each measure.

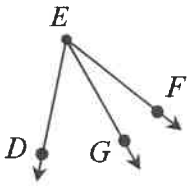


$x =$ _____

$m\angle PQS =$ _____

$m\angle SQR =$ _____

4. If $m\angle DEF = (7x + 4)°$, $m\angle DEG = (5x + 1)°$, and $m\angle GEF = 23°$, find each measure.

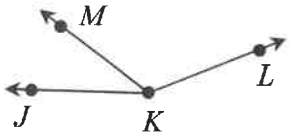


$x =$ _____

$m\angle DEG =$ _____

$m\angle DEF =$ _____

5. If $m\angle JKM = 43°$, $m\angle MKL = (8x – 20)°$, and $m\angle JKL = (10x – 11)°$, find each measure.

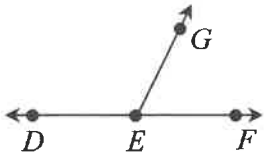


$x =$ _____

$m\angle MKL =$ _____

$m\angle JKL =$ _____

6. If $\angle DEF$ is a straight angle, $m\angle DEG = (23x - 3)°$, and $m\angle GEF = (12x + 8)°$, find each measure.



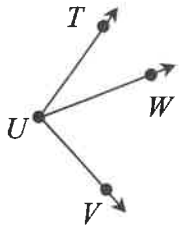
$x =$ _____

$m\angle DEG =$ _____

$m\angle GEF =$ _____

$m\angle DEF =$ _____

7. If $m\angle TUW = (5x + 3)°$, $m\angle WUV = (10x - 5)°$, and $m\angle TUV = (17x - 16)°$, find each measure.



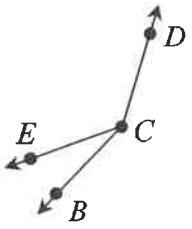
$x =$ _____

$m\angle TUW =$ _____

$m\angle WUV =$ _____

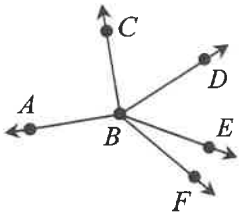
$m\angle TUV =$ _____

8. If $m\angle ECD$ is six less than five times $m\angle BCE$, and $m\angle BCD = 162°$, find each measure.



$m\angle BCE =$ _____

$m\angle ECD =$ _____



Use the diagram to the left to answer questions 9 and 10.

9. If $m\angle ABF = (6x + 26)°$, $m\angle EBF = (2x - 9)°$, and $m\angle ABE = (11x - 31)°$, find $m\angle ABF$.

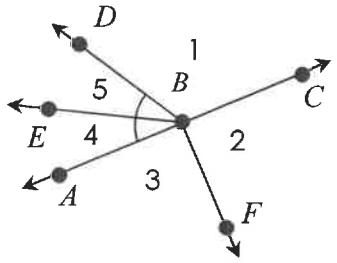
10. If $\overrightarrow{BD}$ bisects $\angle CBE$, $\overline{BC} \perp \overline{BA}$, $m\angle CBD = (3x + 25)°$, and $m\angle DBE = (7x - 19)°$, find $m\angle ABD$.

Name: _____ **Unit 1:** Geometry Basics

Date: _____ **Per:** _____ **Homework 5:** Angle Addition Postulate

**** This is a 2-page document! ****

1. Use the diagram below to complete each part.



* $\overrightarrow{BF} \perp \overrightarrow{AC}$

a) Name the vertex of $\angle 4$. _____

b) Name the sides of $\angle 1$. _____

c) Write another name for $\angle 5$. _____

d) Classify each angle:

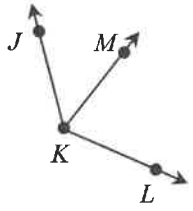
$\angle FBC$: _____ $\angle EBF$: _____ $\angle ABC$: _____

e) Name an angle bisector. _____

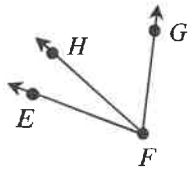
f) If $m\angle EBD = 36°$ and $m\angle DBC = 108°$, find $m\angle EBC$. _____

g) If $m\angle EBF = 117°$, find $m\angle ABE$. _____

2. If $m\angle MKL = 83°$, $m\angle JKL = 127°$, and $m\angle JKM = (9x - 10)°$, find the value of x.



3. If $m\angle EFH = (5x + 1)°$, $m\angle HFG = 62°$, and $m\angle EFG = (18x + 11)°$, find each measure.

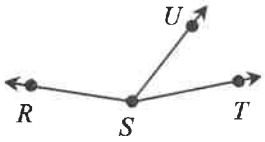


x = _____

$m\angle EFH$ = _____

$m\angle EFG$ = _____

4. If $m\angle RST = (12x - 1)°$, $m\angle RSU = (9x - 15)°$, and $m\angle UST = 53°$, find each measure.

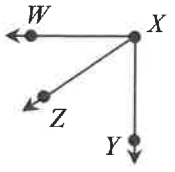


x = _____

$m\angle RST$ = _____

$m\angle RSU$ = _____

5. If $m\angle WXZ = (5x + 3)°$, $m\angle ZXY = (8x - 4)°$, and $\angle WXY$ is a right angle, find each measure.

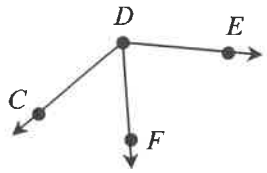


x = _____

$m\angle WXZ$ = _____

$m\angle ZXY$ = _____

6. If $m\angle CDF = (3x + 14)°$, $m\angle FDE = (5x - 2)°$, and $m\angle CDE = (10x - 18)°$, find each measure.



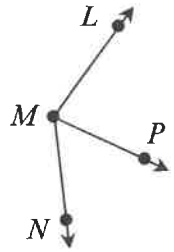
$x =$ _____

$m\angle CDF =$ _____

$m\angle FDE =$ _____

$m\angle CDE =$ _____

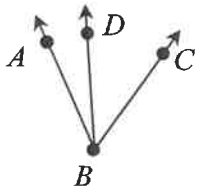
7. If $m\angle LMP$ is 11 degrees more than $m\angle NMP$ and $m\angle NML = 137°$, find each measure.



$m\angle LMP =$ _____

$m\angle NMP =$ _____

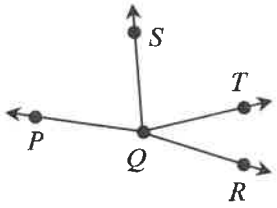
8. If $m\angle ABC$ is one degree less than three times $m\angle ABD$ and $m\angle DBC = 47°$, find each measure.



$m\angle ABD =$ _____

$m\angle ABC =$ _____

9. If $\overrightarrow{QS}$ bisects $\angle PQT$, $m\angle SQT = (8x - 25)°$, $m\angle PQT = (9x + 34)°$, and $m\angle SQR = 112°$, find each measure.



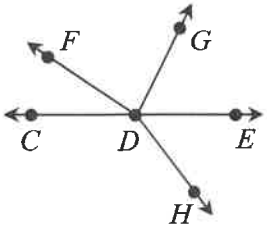
$x =$ _____

$m\angle PQS =$ _____

$m\angle PQT =$ _____

$m\angle TQR =$ _____

10. If $\angle CDE$ is a straight angle, $\overrightarrow{DE}$ bisects $\angle GDH$, $m\angle GDE = (8x - 1)°$, $m\angle EDH = (6x + 15)°$, and $m\angle CDF = 43°$, find each measure.



$x =$ _____

$m\angle GDH =$ _____

$m\angle FDH =$ _____

$m\angle FDE =$ _____

ANGLE Relationships

VERTICAL ANGLES

Two angles **across** from each other on intersecting lines. They are always **congruent!**

Example:

ADJACENT ANGLES

Two angles that are **next to** each other and share a common side.

Example:

LINEAR PAIR

Two angles that are **adjacent** and **supplementary**. They form **a straight line!**

Example:

COMPLEMENTARY ANGLES

Any two angles whose **sum is 90°**

Example:

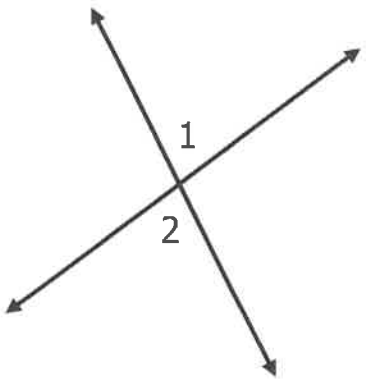
SUPPLEMENTARY ANGLES

Any two angles whose **sum is 180°**

Example:

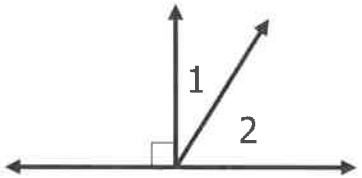
Identifying Types of Angles: Check all relationships between ∠1 and ∠2.

1



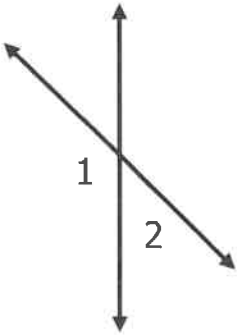
- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

2



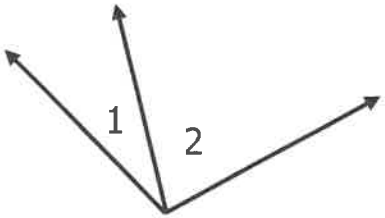
- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

3



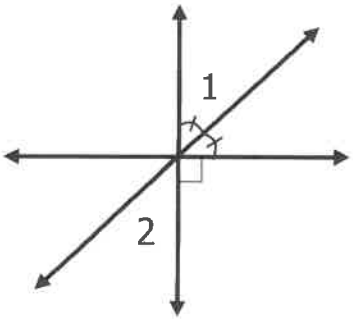
- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

4



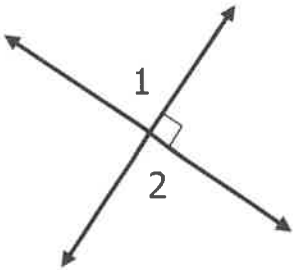
- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

5



- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

6

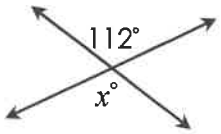


- ❑ Adjacent
- ❑ Vertical
- ❑ Complementary
- ❑ Supplementary
- ❑ Linear Pair

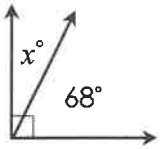
Using ANGLE RELATIONSHIPS to find ANGLE MEASURES

Directions: Find the missing measures in each figure. Keep the angle relationships in mind.

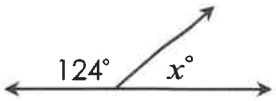
1.



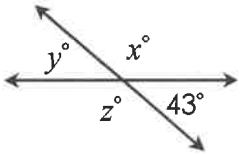
2.



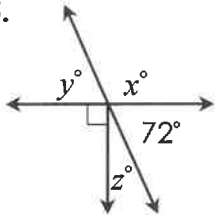
3.



4.



5.



6. $\angle 1$ and $\angle 2$ are vertical angles. If the measure of $\angle 2$ is 105°, find the measure of $\angle 1$.

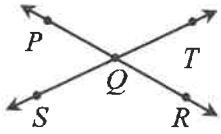
7. $\angle A$ and $\angle B$ are complementary angles. If the measure of $\angle A$ is 42°, find the measure of $\angle B$.

8. $\angle P$ and $\angle Q$ are supplementary angles. If the measure of $\angle Q$ is 64°, find the measure of $\angle P$.

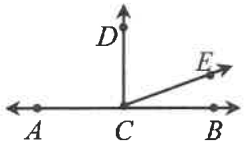
9. $\angle 1$ and $\angle 2$ form a linear pair. If the measure of $\angle 1$ is 113°, find the measure of $\angle 2$.

USING ALGEBRA

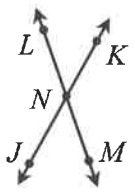
10. If $m\angle PQT = (3x + 47)°$ and $m\angle SQR = (6x - 25)°$, find the measure of $\angle SQR$.



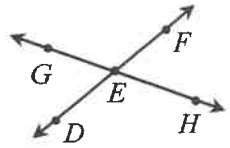
11. If $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$, $m\angle DCE = (7x + 2)°$ and $m\angle ECB = (x + 8)°$, find the measure of $\angle DCE$.



12. If $m\angle KNM = (8x - 5)°$ and $m\angle MNJ = (4x - 19)°$, find the measure of $\angle KNM$.



13. If $m\angle DEG = (5x - 4)°$, $m\angle GEF = (7x - 8)°$, $m\angle DEH = (9y + 5)°$, find the values of x and y.



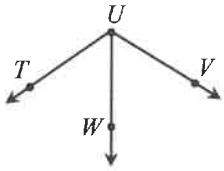
14. $\angle R$ and $\angle S$ are complementary angles. If $m\angle R = (12x - 3)°$ and $m\angle S = (7x - 2)°$, find $m\angle R$.

15. $\angle P$ and $\angle Q$ are supplementary angles. If $m\angle P = (4x + 1)°$ and $m\angle Q = (9x - 3)°$, find $m\angle Q$.

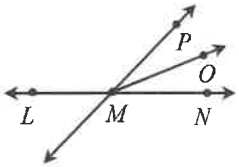
16. $\angle 1$ and $\angle 2$ form a linear pair. The measure of $\angle 2$ is six more than twice the measure of $\angle 1$. Find $m\angle 2$.

17. $\angle J$ and $\angle K$ are complementary angles. The measure of $\angle J$ is 18 less than the measure of $\angle K$. Find the measure of each angle.

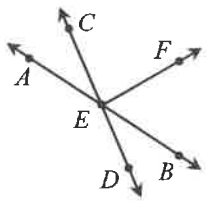
18. If $\overrightarrow{UW}$ bisects $\angle TUV$, $m\angle TUW = (13x - 5)°$ and $m\angle WUV = (7x + 31)°$, find the value of x.



19. If $\overrightarrow{MO}$ bisects $\angle PMN$, $m\angle PMN = 74°$ and $m\angle OMN = (2x + 7)°$, find the value of x.



20. If $\overrightarrow{EF}$ bisects $\angle CEB$, $m\angle CEF = (7x + 21)°$ and $m\angle FEB = (10x - 3)°$, find the measure of $\angle DEB$.

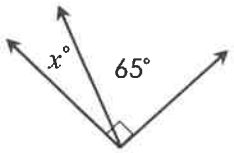


Name: _____ **Unit 1:** Geometry Basics

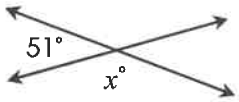
Date: _____ **Per:** _____ **Homework 6:** Angle Relationships

**** This is a 2-page document! ****

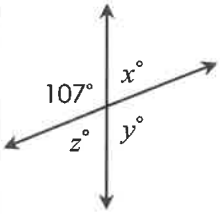
1. Find the missing measure.



2. Find the missing measure.



3. Find the missing measures.



4. If the measure of an angle is 13°, find the measure of its supplement.

5. If the measure of an angle is 38°, find the measure of its complement.

6. $\angle 1$ and $\angle 2$ form a linear pair. If $m\angle 1 = (5x + 9)°$ and $m\angle 2 = (3x + 11)°$, find the measure of each angle.

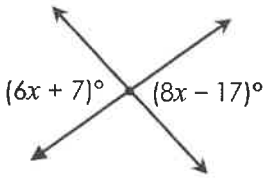
7. $\angle 1$ and $\angle 2$ are vertical angles. If $m\angle 1 = (17x + 1)°$ and $m\angle 2 = (20x - 14)°$, find $m\angle 2$.

8. $\angle K$ and $\angle L$ are complementary angles. If $m\angle K = (3x + 3)°$ and $m\angle L = (10x - 4)°$, find the measure of each angle.

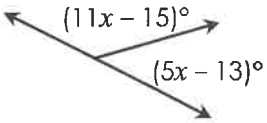
9. If $m\angle P$ is three less than twice the measure of $\angle Q$, and $\angle P$ and $\angle Q$ are supplementary angles, find each angle measure.

10. If $m\angle B$ is two more than three times the measure of $\angle C$, and $\angle B$ and $\angle C$ are complementary angles, find each angle measure.

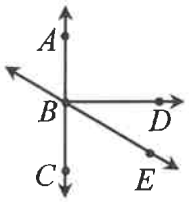
11. Find the value of x.



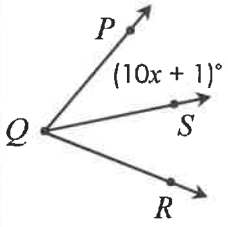
12. Find the value of x.



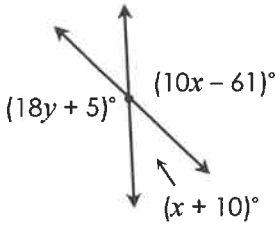
13. If $\overrightarrow{BD} \perp \overrightarrow{AC}$, $m\angle DBE = (2x - 1)°$, and $m\angle CBE = (5x - 42)°$, find the value of x.



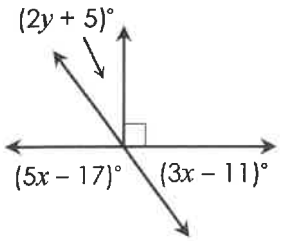
14. Find the value of x if $\overrightarrow{QS}$ bisects $\angle PQR$ and $m\angle PQR = 82°$.



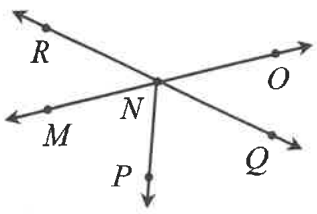
15. Find the values of x and y.



16. Find the values of x and y.



17. If $\overrightarrow{NP}$ bisects $\angle MNQ$, $m\angle MNQ = (8x + 12)°$, $m\angle PNQ = 78°$, and $m\angle RNM = (3y - 9)°$, find the values of x and y.



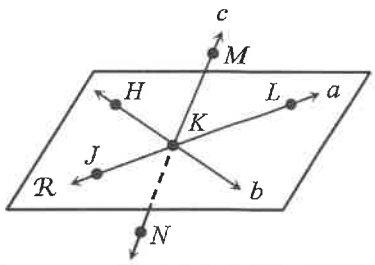
Unit 1 Test Study Guide
(Geometry Basics)

Name: _____

Date: _____ **Per:** _____

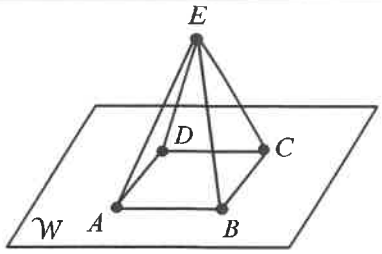
Topic 1: Points, Lines & Planes

Use the diagram to the right to answer questions 1-4.



1. Name two points collinear to point K. _____
2. Give another name for line b. _____
3. Name the intersection of line c and plane R. _____
4. Name a point non-coplanar to plane R. _____

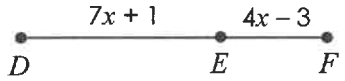
Use the diagram to the right to answer questions 5-8.



5. How many planes are shown in the figure? _____
6. Give another name for plane W. _____
7. Name the intersection of plane ADE and plane W. _____
8. Name a point non-collinear to points A and B. _____

Topic 2: Segment Addition Postulate

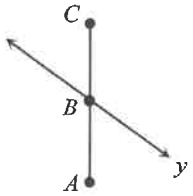
9. If $DF = 42$, find DE.



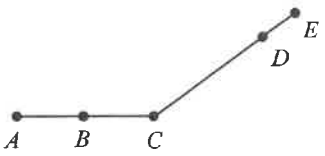
10. In the diagram below, if $JL = 10x - 2$, $JK = 5x - 8$, and $KL = 7x - 12$, find KL.

11. If S is the midpoint of $\overline{RT}$, $RS = 5x + 17$, and $ST = 8x - 31$, find RS.

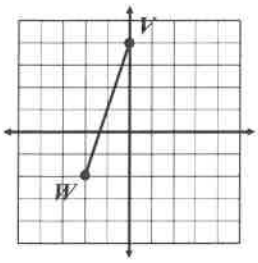
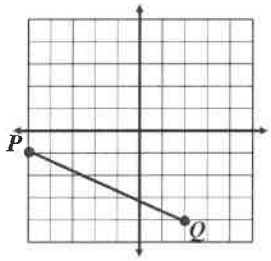
12. If line y bisects $\overline{AC}$, $AB = 4 - 5x$, and $BC = 2x + 25$, find AC.



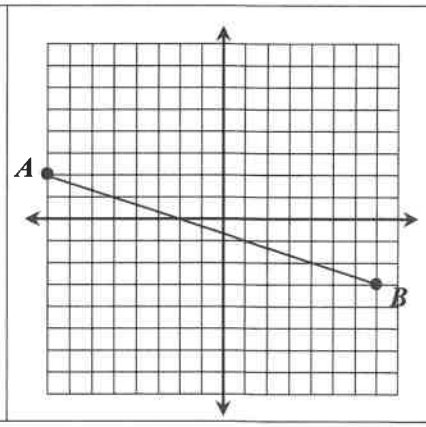
13. If B is the midpoint of $\overline{AC}$, $AC = CD$, $AB = 3x + 4$, $AC = 11x - 17$, and $CE = 49$, find DE.



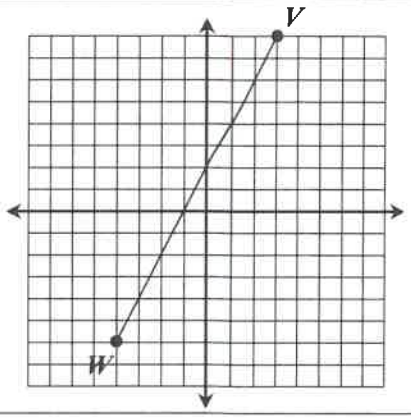
Topic 3: Distance & Midpoint Formula

DISTANCE FORMULA:	**MIDPOINT FORMULA:**
14. Find ST if $S(-3, 10)$ and $T(-2, 3)$.	**15.** Find BC if $B(8, -7)$ and $C(-4, -2)$.
16. Given the graph below, find WV. 	**17.** Given the graph below, find PQ. 
18. Find the coordinates of the midpoint of $\overline{HK}$ if $H(-1, 2)$ and $K(-7, -4)$.	**19.** Find the coordinates of Z if Y is the midpoint of $\overline{XZ}$, $X(-10, 9)$, and $Y(-4, 8)$.

Topic 4: Partitioning a Segment

20. Given directed line segment $\overline{AB}$, find the coordinates of P such that the ratio of AP to AB is 4:5. Plot point P.	

21. Given directed line segment $\overline{WV}$, find the coordinates of R such that the ratio of WR to RV is 3:4. Plot point R.



22. Given $\overline{EF}$ with $E(-7, 4)$ and $F(-4, -5)$, if G lies on $\overline{EF}$ such that the ratio of EG to GF is 1:2, find the coordinates of G.

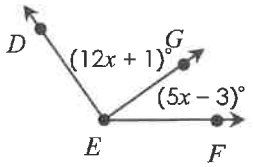
23. Given $\overline{JL}$ with $J(-5, -1)$ and $L(19, -9)$, if K lies on $\overline{JL}$ such that the ratio of JK to JL is 7:8, find the coordinates of K.

24. Given $\overline{CH}$ with $C(2, 1)$ and $H(-2, -15)$, find the coordinates of E if E divides CH three-fourths of the way from C to H.

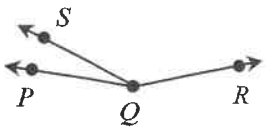
25. A man in a tower spots three hot air balloons flying at the same altitude. Balloon A is 5 miles east and 8 miles south of the tower. Balloon B is 7 miles west and 10 miles north of the tower. If Balloon C is located four-ninths the distance from Balloon A to Balloon B, find the location of Balloon C relative to the tower.

Topic 5: Angle Measures

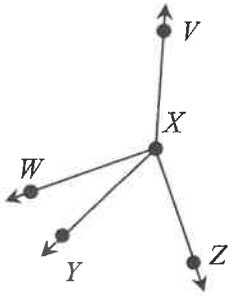
26. If $m\angle DEF = 117°$, find the value of x.



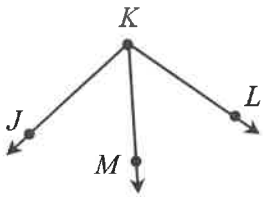
27. If $m\angle PQS = 16°$, $m\angle SQR = (9x + 17)°$, and $m\angle PQR = (12x - 6)°$, find $m\angle PQR$.



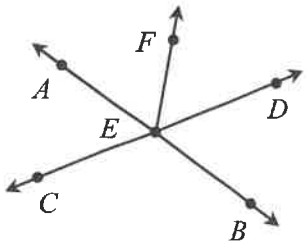
28. In the diagram below, $\angle WXZ$ is a right angle. If $m\angle WXV$ is eleven more than three times $m\angle WXY$ and $m\angle YXV = 139°$, find $m\angle YXZ$.



29. If $\overleftrightarrow{KM}$ bisects $\angle JKL$, $m\angle JKL = 92°$, and $m\angle MKL = (5x + 1)°$, find the value of x.

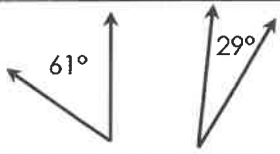


30. If $\overleftrightarrow{EF}$ bisects $\angle AED$, $m\angle AEF = (4x + 3)°$, and $m\angle FED = (7x - 33)°$, find $m\angle CEB$.

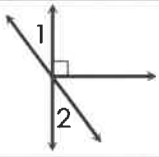


Use the diagrams below to answer 31-35.

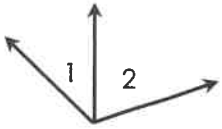
A.



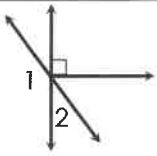
B.



C.

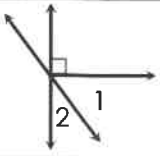


D.



E.

F.



31. Which diagram(s) show adjacent angles? _____

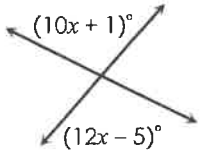
32. Which diagram(s) show vertical angles? _____

33. Which diagram(s) show complementary angles? _____

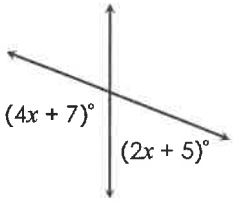
34. Which diagram(s) show supplementary angles? _____

35. Which diagram(s) show a linear pair? _____

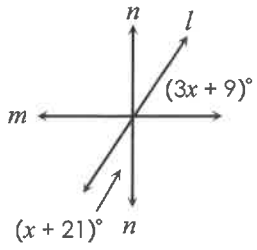
36. Solve for x.



37. Solve for x.



38. If $m \perp n$, solve for x.



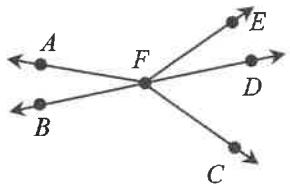
39. $\angle 1$ and $\angle 2$ form a linear pair. If $m\angle 1 = (18x - 1)^\circ$ and $m\angle 2 = (23x + 17)^\circ$, find $m\angle 2$.

40. $\angle G$ and $\angle H$ are complementary angles. If $m\angle G = (6x - 15)^\circ$ and $m\angle H = (3x + 6)^\circ$, find $m\angle H$.

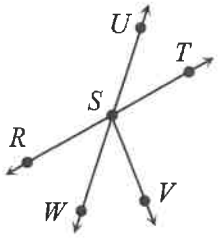
41. $\angle 1$ and $\angle 2$ are vertical angles. If $m\angle 1 = (5x + 12)^\circ$ and $m\angle 2 = (6x - 11)^\circ$, find $m\angle 1$.

42. The measure of $\angle P$ is five less than four times the measure of $\angle Q$. If $\angle P$ and $\angle Q$ are supplementary angles, find $m\angle P$.

43. In the diagram below, $\angle AFB \cong \angle EFD$. If $m\angle EFD = (5x + 6)^\circ$, $m\angle DFC = (19x - 15)^\circ$, and $m\angle EFC = (17x + 19)^\circ$, find $m\angle AFE$.



44. If $\overrightarrow{SV} \perp \overrightarrow{RT}$, $m\angle RSU = (17x - 3)^\circ$, and $m\angle UST = (6x - 1)^\circ$, find each missing measure.



$x =$ _____

$m\angle RSU =$ _____

$m\angle UST =$ _____

$m\angle WSV =$ _____

$m\angle VSU =$ _____