Geometry-Unit 1: Tools of Geometry

Mon	Tue	Wed	Thu	Fri
Aug 26 Introductions, Expectations, Course Outline and Carnegie	Aug 27 Review summer packet	Aug 28 Topic: (1-1) Points, Lines, & Planes HW	Aug 29 Topic: (1-2) Segment Measure HW	Aug 30 Quiz on summer packet
Sept 2 Topic: (1-3) Segment Measure HW	Sept 3 Topic: (1-2 & 1-3) Segment Measure HW	Sept 4 Quiz 1-1 through 1-3	Sept 5 (Two-Hour Delay) Topic: (1-4) Angle Measure HW	Sept 6 Carnegie Day
Sept 9 Topic: (1-4) Angle Measure HW	Sept 10 Topic: (1-5) Angle Pairs HW	Sept 11 Topic: (1-5) Angle Pairs HW	Sept 12 Quiz 1-4 & 1-5	Sept 13 Carnegie Day
Sept 16 Study Guide	Sept 17 Unit 1 Test	Sept 18	Sept 19	Sept 20 Carnegie Day

This is a tentative schedule, date may change. Please be sure to write down homework assignments daily.

Geometry-Unit 1: Tools of Geometry

Topic: Unit 1(12 days) - Tools of Geometry (Chapter 1)

Key Learning(s): Students will learn the basic geometry terms and there use for continuing geometry.

Unit Essential Question(s): Why is it important to learn the basic geometry terms and concepts before continuing the course?

Optional Instructional Tools

Ruler, protractor, graph/number line paper

Concept: Points, Lines & Planes (1.1 – 1 days)	**Concept:** Segment Measure (1.2, 1.3 – 3 days)	**Concept:** Angle Measure (1.4 – 2 days)	**Concept:** Angle Pairs (1.5 – 2 days)
Lesson EQ's: What are the basic terms and their importance to Geometry?	**Lesson EQ's:** How are the lengths of segments used in everyday life?	**Lesson EQ's:** Why do we need to understand and use angles in Geometry?	**Lesson EQ's:** How are the pairs of angles classified?
Vocabulary: Point, line, plane, collinear, coplanar, space	**Vocabulary:** Line segment, segment addition postulate, between, congruent, precision, constructions, midpoint, segment bisector, distance	**Vocabulary:** Degree, vertex, ray, opposite ray, angles, sides, interior, exterior, acute angle, obtuse angle, right angle	**Vocabulary:** Vertical angles, linear angles, adjacent angles, complementary angles, supplementary angles
Standards:	**Standards:** **M11.C.3.1.1** Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane **G.2.1.2.1** Calculate the distance and/or midpoint between two points on a number line or on a coordinate plane	**Standards:** **M11.B.2.1.1** Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn).	**Standards:** **M11.B.2.1.1** Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn).

	Point	Line	Plane	Segment	Ray	Angle
Model						
Drawn						
Named By						
Facts						
Words/ Symbol						

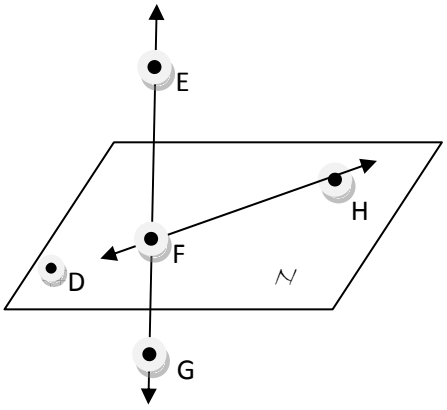
Define the following:

Space-

Collinear-

Coplanar-

Naming Lines and Planes (See Chart)

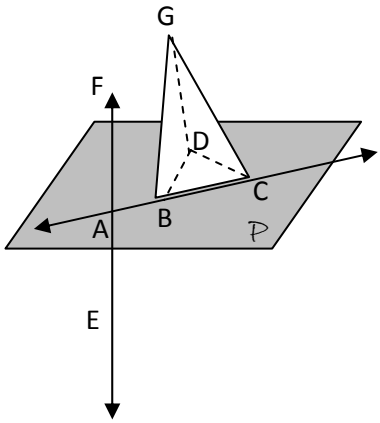
Picture	Figure to name	How did you label it?
	A point on the plane.	
	A line that contains point G	
	A plane	
	A point not on the plane.	

Drawing a Geometric Figure

1. **Together:**
   a. $\overleftrightarrow{TU}$ lies in the plane ***Q*** and contains the point R.

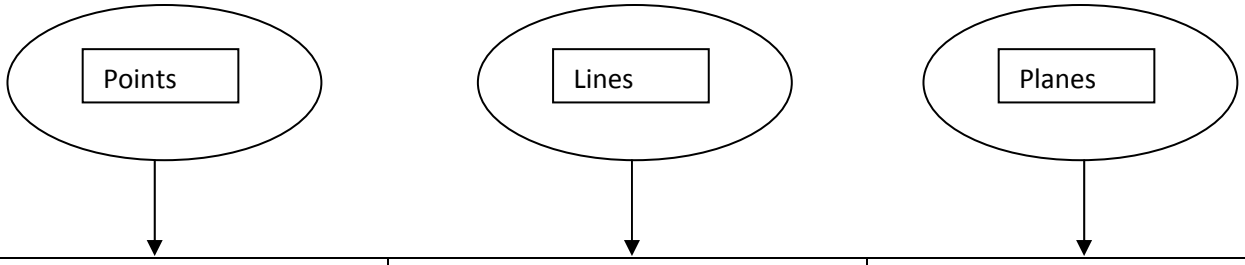
2. **Check Your Progress (On Your Own)**
   a. Draw and label a figure in which points A, B, and C are coplanar and B and C are collinear.

Interpret Drawings:



1. **Together, we will answer questions based on the picture to right:**
   a. How many planes appear in this figure? _____
   b. Name three collinear points. _____
   c. Are points G, A, B, and D coplanar? _____
   d. Where does $\overleftrightarrow{EF}$ and $\overleftrightarrow{AB}$ intersect? _____
   e. Name the intersection of plane GCD and plane $\mathcal{P}$. _____

Reflection: What types of everyday objects could we use to represent these types of undefined terms?

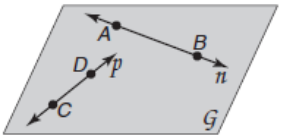


NAME _____ DATE _____ PERIOD _____

1-1 Skills Practice

Points, Lines, and Planes

Refer to the figure.



1. Name a line that contains point D.

2. Name a point contained in line n.

3. What is another name for line p?

4. Name the plane containing lines n and p.

Draw and label a figure for each relationship.

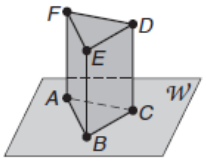
5. Point K lies on $\overline{RT}$.

6. Plane $\mathcal{J}$ contains line s.

7. $\overleftrightarrow{YP}$ lies in plane $\mathcal{B}$ and contains point C, but does not contain point H.

8. Lines q and f intersect at point Z in plane $\mathcal{U}$.

Refer to the figure.



9. How many planes are shown in the figure?

10. How many of the planes contain points F and E?

11. Name four points that are coplanar.

12. Are points A, B, and C coplanar? Explain.

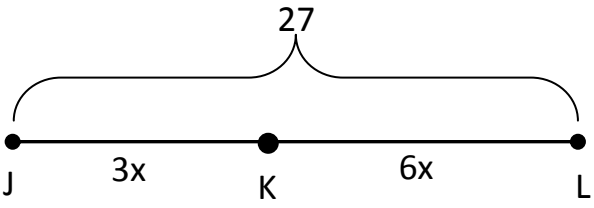
Define the following vocabulary words:

- Be sure to use complete sentences
- Include an example or picture
- Relate it to real life

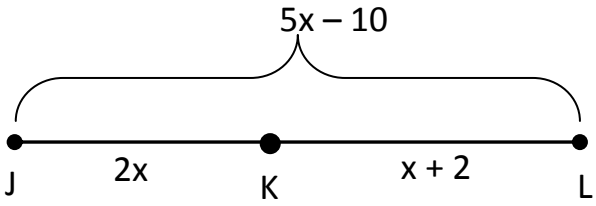
Word	Definition	Picture/Example	Real Life Connection
Segment			
Congruent			
Midpoint			
Segment Bisector			
Segment Addition Postulate			
Distance			

Definition:

Example 1: Find the value of x and KL



Example 2: Find x and KL

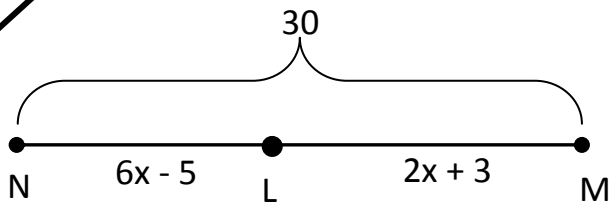


1.2
Segment
Addition
Postulate

Example 3: Find the value of

x and ST if S is between R and T and: RS = 7, ST = 3x, and RT = 25

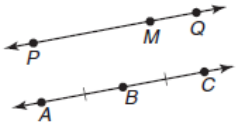
Example 4: Find x and LM



1-2 Study Guide and Intervention *(continued)*

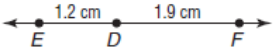
Linear Measure and Precision

Calculate Measures On $\overrightarrow{PQ}$, to say that point M is between points P and Q means P, Q, and M are collinear and $PM + MQ = PQ$.



On $\overrightarrow{AC}$, $AB = BC = 3$ cm. We can say that the segments are **congruent**, or $\overline{AB} \cong \overline{BC}$. Slashes on the figure indicate which segments are congruent.

Example 1 **Find *EF*.**

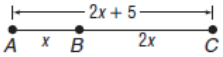


Calculate EF by adding ED and DF.

$ED + DF = EF$
$1.2 + 1.9 = EF$
$3.1 = EF$

Therefore, $\overline{EF}$ is 3.1 centimeters long.

Example 2 **Find x and AC.**



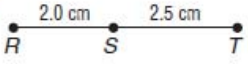
B is between A and C.

$AB + BC = AC$
$x + 2x = 2x + 5$
$3x = 2x + 5$
$x = 5$
$AC = 2x + 5 = 2(5) + 5 = 15$

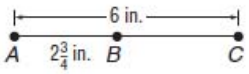
Exercises

Find the measurement of each segment. Assume that the art is not drawn to scale.

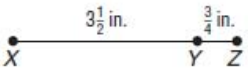
1. $\overline{RT}$



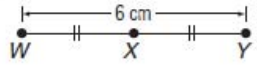
2. $\overline{BC}$



3. $\overline{XZ}$



4. $\overline{WX}$



Find x and RS if S is between R and T.

5. $RS = 5x$, $ST = 3x$, and $RT = 48$.

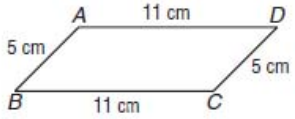
6. $RS = 2x$, $ST = 5x + 4$, and $RT = 32$.

7. $RS = 6x$, $ST = 12$, and $RT = 72$.

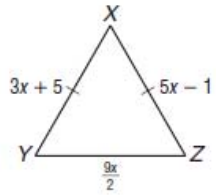
8. $RS = 4x$, $\overline{RS} \cong \overline{ST}$, and $RT = 24$.

Use the figures to determine whether each pair of segments is congruent.

9. $\overline{AB}$ and $\overline{CD}$



10. $\overline{XY}$ and $\overline{YZ}$



Find the Distance

Given the coordinate plane

(Two ordered pairs)

Step 1: Write formula from Formula Sheet

Step 2: Substitute x and y from the two given points

Step 3: Evaluate

GUIDED PRACTICE

Example: Find the distance between (2, 3) and (6,6)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

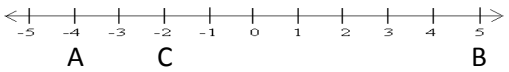
Example: Find the distance between (1, 4) and (6,8)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

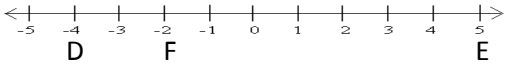
Given a number line

Count the spaces between the two given points.

Example: Find the distance between A and B



Example: Find the distance between D and F



Find the Midpoint

Given the coordinate plane

(Two ordered pairs)

Step 1: Write formula from Formula Sheet

Step 2: Substitute x and y from the two given points

Step 3: Evaluate

GUIDED PRACTICE

Example: Find the midpoint between (2, 3) and (6,6)

$$\left(\frac{x_2+x_1}{2},\frac{y_2+y_1}{2}\right)$$

Example: Find the midpoint between (1, 4) and (6,8)

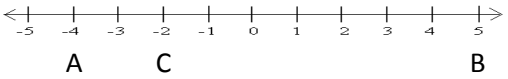
$$\left(\frac{x_2+x_1}{2},\frac{y_2+y_1}{2}\right)$$

Given a number line

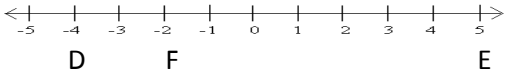
Count the spaces between the two given points.

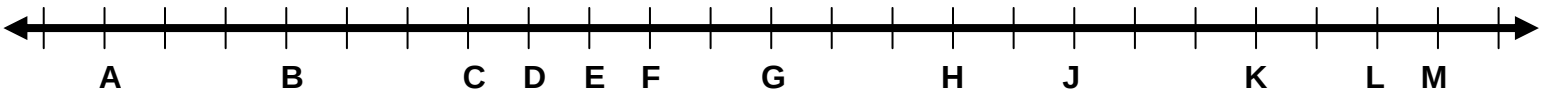
Divide by 2

Example: Find the midpoint between A and B



Example: Find the midpoint between D and F



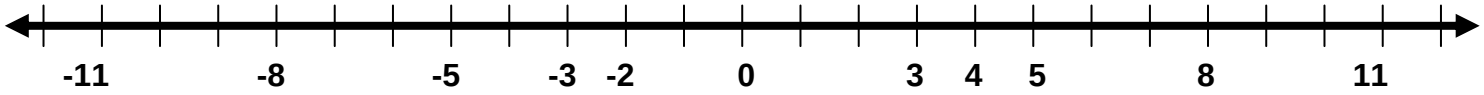


Find the length of each segment using the number line above:

1. $\overline{AD}$ 2. $\overline{HL}$ 3. $\overline{EJ}$ 4. $\overline{CG}$

Find the midpoint of the given segments using the number line above

5. $\overline{AC}$ 6. $\overline{JM}$ 7. $\overline{DF}$ 8. $\overline{BG}$



Find the length of each segment given the two endpoints from the number line above

9. -8 and 5 10. -3 and 11 11. -11 and -2

Distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Midpoint formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Find the distance between the two points

1. (5, 1) (-3, -3) 2. (3, -4) (-2, -10) 3. (-5, 6) (8, -4)

Find the midpoint between the two points

4. (5, -2) (-1, 6) 5. (5, 12) (-4, 8) 6. Given J(-5, 10) and the midpoint of $\overline{JK}$ is (-8, 6) find the coordinate for K

Homework 1-3

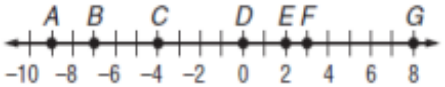
Use the number line to find each measure.

1. BD
2. DG
3. AF
4. EF
5. BG
6. AG
7. BE
8. DE

Use the Distance Formula to find the distance between each pair of points.

13. $A(0, 0), B(15, 20)$
14. $O(-12, 0), P(-8, 3)$
15. $C(11, -12), D(6, 2)$
16. $E(-2, 10), F(-4, 3)$

Use the number line to find the coordinate of the midpoint of each segment.



1. $\overline{CE}$
2. $\overline{DG}$
3. $\overline{AF}$
4. $\overline{EG}$
5. $\overline{AB}$
6. $\overline{BG}$
7. $\overline{BD}$
8. $\overline{DE}$

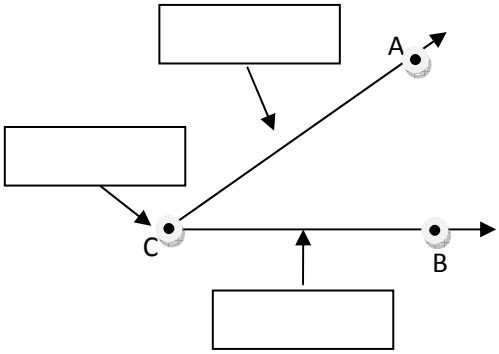
Find the coordinates of the midpoint of a segment having the given endpoints.

9. $A(0, 0), B(12, 8)$
10. $R(-12, 8), S(6, 12)$
11. $M(11, -2), N(-9, 13)$
12. $E(-2, 6), F(-9, 3)$
13. $S(10, -22), T(9, 10)$
14. $M(-11, 2), N(-19, 6)$

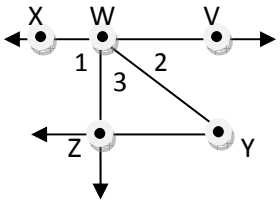
Define the following vocabulary words:

- Be sure to use complete sentences
- Include an example or picture
- Relate it to real life

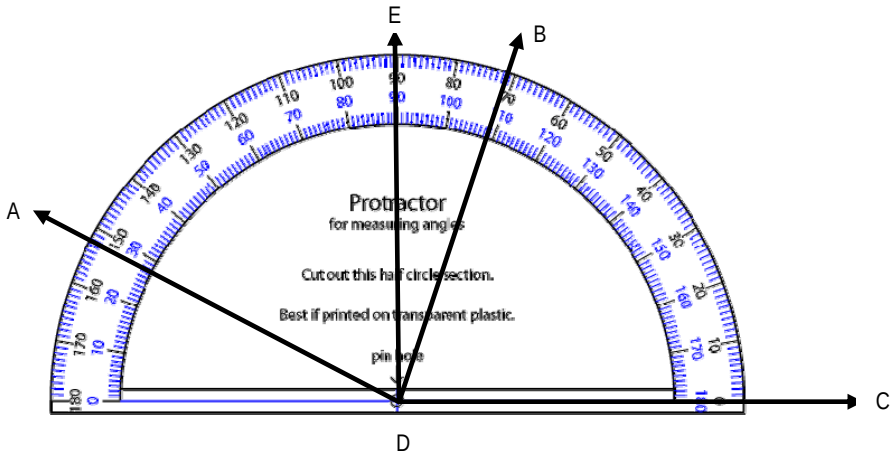
Word	Definition	Picture/Example	Real Life Connection
Vertex			
Rays (Sides)			
Straight Angle			
Angle			
Right Angle			
Acute Angle			
Obtuse Angle			



Angles and Their Parts



1. **Together, we are going to identify parts using the diagram to the right**
   a. Name 3 angles that have W as a vertex.
   b. Name all the sides of $\angle 1$.
   c. Write another name for $\angle WYZ$.
   d. Name a pair of opposite rays.



How to read a protractor:

1. Put the dot in the center on the vertex
2. Line up the protractor with one of the rays crossing the 0
3. Read where the arrow crosses and use the correct number. (Big Angle Big #, Small Angle Small #)

Find: $m\angle ADC =$ $m\angle BDC =$ $m\angle BDA =$ (challenge problem)

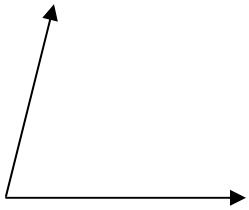
How to draw angles using a protractor:

1. Draw a ray
2. Place protractor with center dot at endpoint on ray
3. Using the numbers carefully mark the number you need on the outside of the protractor
4. Draw a new ray from the endpoint to the mark you made

80^o	**95^o**
120^o	**100^o**

22^{o}	**168^{o}**
51^{o}	**107^{o}**

Opposite Rays -



The rays that form an angle are called the _____.

The common endpoint is the _____.

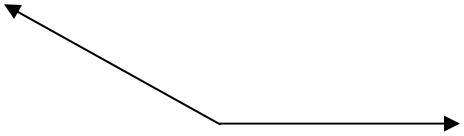
The _____ is the points inside the angle.

The _____ is the points outside the angle.

Angles can be classified by their measures

Straight **Right** **Acute** **Obtuse**

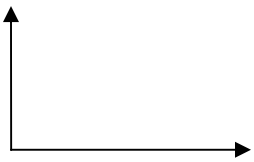
Classify each angle:

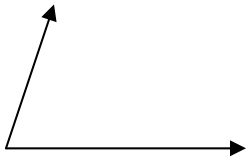
1. 

2. 

3. 

4. 

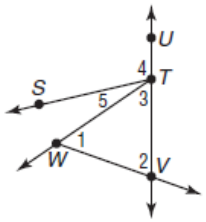
5. 

6. 

1-4 Skills Practice

Angle Measure

For Exercises 1–12, use the figure at the right.



Name the vertex of each angle.

1. $\angle 4$

2. $\angle 1$

3. $\angle 2$

4. $\angle 5$

Name the sides of each angle.

5. $\angle 4$

6. $\angle 5$

7. $\angle STV$

8. $\angle 1$

Write another name for each angle.

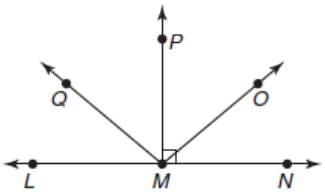
9. $\angle 3$

10. $\angle 4$

11. $\angle WTS$

12. $\angle 2$

Measure each angle and classify it as *right*, *acute*, or *obtuse*.



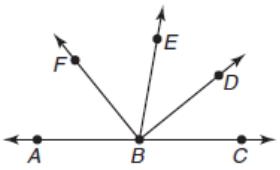
13. $\angle NMP$

14. $\angle OMN$

15. $\angle QMN$

16. $\angle QMO$

ALGEBRA **In the figure, $\overrightarrow{BA}$ and $\overrightarrow{BC}$ are opposite rays, $\overrightarrow{BD}$ bisects $\angle EBC$, and $\overrightarrow{BF}$ bisects $\angle ABE$.**



17. If $m\angle EBD = 4x + 16$ and $m\angle DBC = 6x + 4$, find $m\angle EBD$.

18. If $m\angle ABF = 7x - 8$ and $m\angle EBF = 5x + 10$, find $m\angle EBF$.

Define the following vocabulary words:

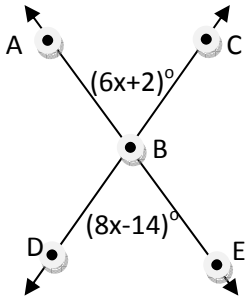
- Be sure to use complete sentences
- Include an example or picture
- Relate it to real life

Word	Definition	Picture/Example	Real Life Connection
Vertical Angles			
Linear Angles			
Adjacent Angles			
Complementary Angles			
Supplementary Angles			

Using Algebra with Angles

1. **Together we will solve for:**

   a. Suppose $\angle ABC \cong \angle DBF$ as shown, find the actual measure of each angle.



   b. Suppose $\overrightarrow{QP}$ and $\overrightarrow{QR}$ are opposite rays, and $\overrightarrow{QT}$ bisects $\angle RQS$. If $\angle RQT = 6x + 5$ and $\angle SQT = 7x - 2$. Find the measure of $\angle RQT$.

2. **Check Your Progress (On Your Own)**
   i. **Hint Draw a Diagram to help you visualize.**

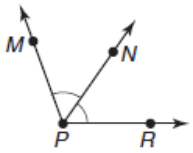
   a. Suppose $\angle JKL \cong \angle MKN$. If $\angle JKL = 5x + 4$ and $\angle MKN = 3x + 12$. Find the actual measure of each angle.

   b. Suppose $\overrightarrow{QP}$ and $\overrightarrow{QR}$ are opposite rays, and $\overrightarrow{QT}$ bisects $\angle RQS$. If $\angle RQS = 22a - 11$ and $\angle RQT = 12a - 8$. Find the measure of $\angle TQS$.

1-4 Study Guide and Intervention *(continued)*

Angle Measure

Congruent Angles Angles that have the same measure are **congruent angles**. A ray that divides an angle into two congruent angles is called an **angle bisector**. In the figure, $\overrightarrow{PN}$ is the angle bisector of $\angle MPR$. Point N lies in the interior of $\angle MPR$ and $\angle MPN \cong \angle NPR$.



Example **Refer to the figure above. If $m\angle MPN = 2x + 14$ and $m\angle NPR = x + 34$, find x and find $m\angle MPR$.**

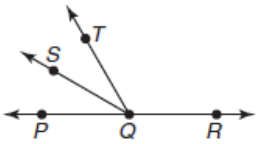
Since $\overrightarrow{PN}$ bisects $\angle MPR$, $\angle MPN \cong \angle NPR$, or $m\angle MPN = m\angle NPR$.

$$\begin{aligned} 2x + 14 &= x + 34 \\ 2x + 14 - x &= x + 34 - x \\ x + 14 &= 34 \\ x + 14 - 14 &= 34 - 14 \\ x &= 20 \end{aligned}$$

$$\begin{aligned} m\angle NPR &= (2x + 14) + (x + 34) \\ &= 54 + 54 \\ &= 108 \end{aligned}$$

Exercises

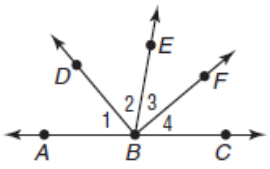
$\overrightarrow{QS}$ bisects $\angle PQT$, and $\overrightarrow{QP}$ and $\overrightarrow{QR}$ are opposite rays.



1. If $m\angle PQT = 60$ and $m\angle PQS = 4x + 14$, find the value of x.

2. If $m\angle PQS = 3x + 13$ and $m\angle SQT = 6x - 2$, find $m\angle PQT$.

$\overrightarrow{BA}$ and $\overrightarrow{BC}$ are opposite rays, $\overrightarrow{BF}$ bisects $\angle CBE$, and $\overrightarrow{BD}$ bisects $\angle ABE$.



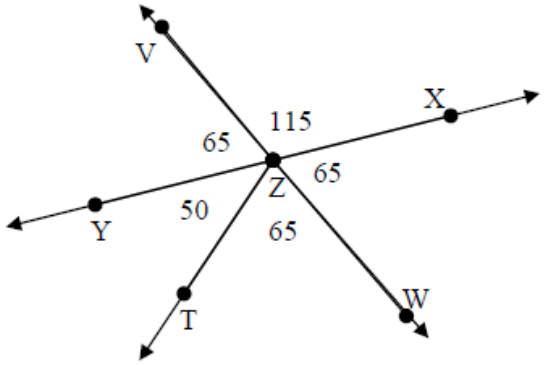
3. If $m\angle EBF = 6x + 4$ and $m\angle CBF = 7x - 2$, find $m\angle EBC$.

4. If $m\angle 1 = 4x + 10$ and $m\angle 2 = 5x$, find $m\angle 2$.

5. If $m\angle 2 = 6y + 2$ and $m\angle 1 = 8y - 14$, find $m\angle ABE$.

6. Is $\angle DBF$ a right angle? Explain.

Use the picture below to answer the following questions



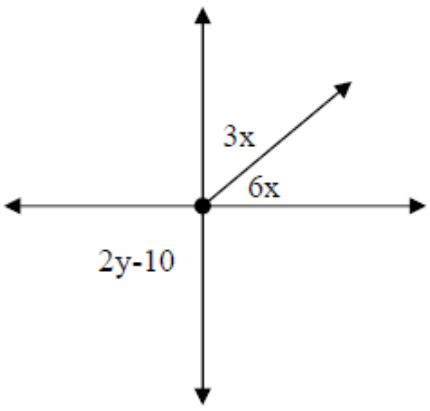
1. Name two obtuse vertical angles

2. Name two acute adjacent angles

3. Name a linear pair

Perpendicular -

Find x and y so that the lines are perpendicular



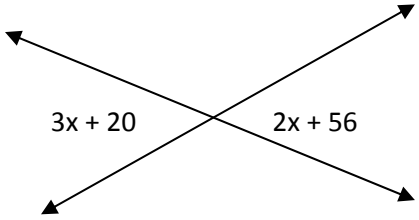
1. Two angles are supplementary. One is 3 times the other. What is the measure of each angle?

2. An angle measures 3x. Its complement is 9 more than that. What is the measure of each angle?

3. Angle 1 is $(5x - 3)^\circ$. Angle 2 is $(2x + 9)^\circ$. Angle 1 and Angle 2 are vertical angles. Find the measure of each angle.

4. Find $m\angle T$ if $m\angle T$ is 20 more than 4 times the measure of its supplement.

Angle Practice: Look at the picture, then determine what type of angles you have and how to find their measure using the boxes provided. Then SOLVE for x, and find the measurement of each angle!



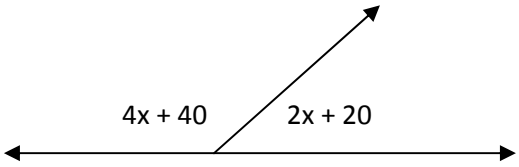
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



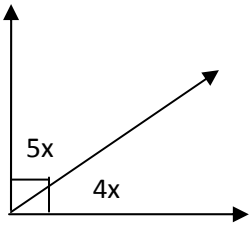
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



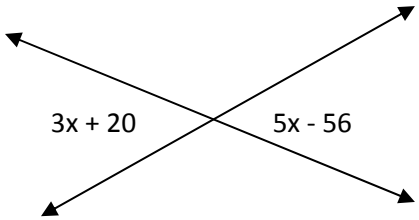
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



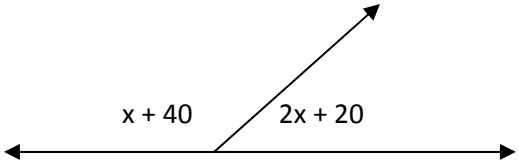
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



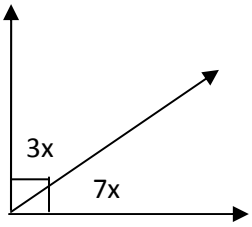
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



Solution:

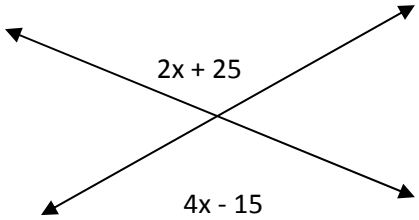
Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty

Angle Homework: Look at the picture, then determine what type of angles you have and how to find their measure using the boxes provided. Then SOLVE for x, and find the measurement of each angle!



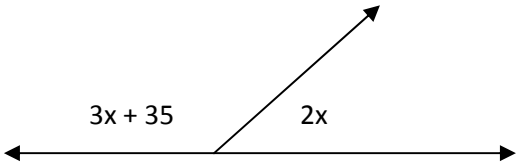
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



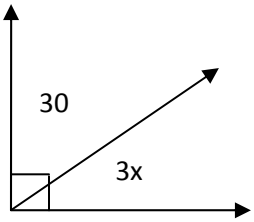
Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

Are they equal to?

Each other Ninety Degrees One-hundred Eighty



Solution:

Circle the type of angle you have and the measurement:

Vertical Complementary Supplementary

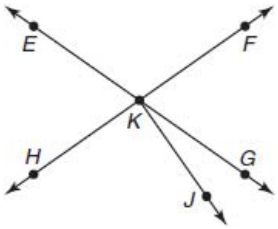
Are they equal to?

Each other Ninety Degrees One-hundred Eighty

1-5 Skills Practice

Angle Relationships

For Exercises 1–6, use the figure at the right and a protractor.



1. Name two acute vertical angles.

2. Name two obtuse vertical angles.

3. Name a linear pair.

4. Name two acute adjacent angles.

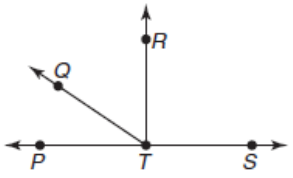
5. Name an angle complementary to $\angle EKH$.

6. Name an angle supplementary to $\angle FKG$.

7. Find the measures of an angle and its complement if one angle measures 18 degrees more than the other.

8. The measure of the supplement of an angle is 36 less than the measure of the angle. Find the measures of the angles.

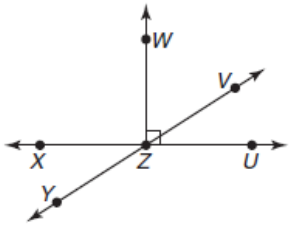
ALGEBRA For Exercises 9–10, use the figure at the right.



9. If $m\angle RTS = 8x + 18$, find x so that $\overrightarrow{TR} \perp \overrightarrow{TS}$.

10. If $m\angle PTQ = 3y - 10$ and $m\angle QTR = y$, find y so that $\angle PTR$ is a right angle.

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



11. $\angle WZU$ is a right angle.

12. $\angle YZU$ and $\angle UZV$ are supplementary.

13. $\angle VZU$ is adjacent to $\angle YZX$.