

# Tools For Geometry

Review Chapter 1

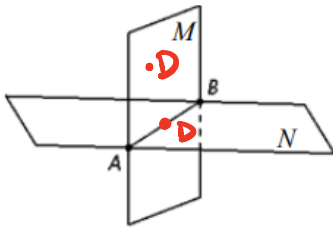
Name \_\_\_\_\_

<ul style="list-style-type: none"> <li>• acute, right, obtuse straight angle</li> <li>• adjacent angles</li> <li>• angle bisector</li> <li>• collinear points</li> <li>• coplanar</li> <li>• complementary angles</li> <li>• congruent</li> </ul>	<ul style="list-style-type: none"> <li>• distance</li> <li>• line</li> <li>• linear pair</li> <li>• measure of an angle</li> <li>• midpoint</li> <li>• plane</li> <li>• point</li> <li>• postulate</li> </ul>	<ul style="list-style-type: none"> <li>• ray, opposite rays</li> <li>• segment</li> <li>• segment bisector</li> <li>• sides of an angle</li> <li>• space</li> <li>• supplementary angles</li> <li>• vertex of an angle</li> <li>• vertical angles</li> </ul>
---	---	--

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

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

1. Add a point  $C$  to the picture so that it is collinear with  $A$  and  $B$ . Then add a point  $D$  so that it is coplanar with plane  $M$ .



2. Use picture to answer the following:

a. Name the 3 lines that intersect at  $T$ .

$\overleftrightarrow{ST}$ ,  $\overleftrightarrow{LX}$ ,  $\overleftrightarrow{TV}$

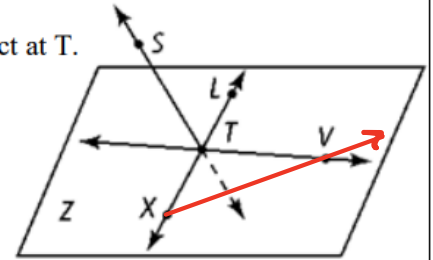
b. Name two opposite rays.

$\overrightarrow{TL}$  &  $\overrightarrow{TX}$

c. Draw  $\overrightarrow{XV}$ .

d. What is the intersection of plane  $Z$  and plane  $STL$ ?

$\overleftrightarrow{XL}$



Find the midpoint and distance between each pair of points.

3)  $(-2, 2)$ ,  $(-2, 5)$

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

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

$$= \left( -2, \frac{7}{2} \right)$$

$$M = (-2, 3.5)$$

$$d = \sqrt{[\Delta x]^2 + [\Delta y]^2}$$

$$= \sqrt{[(-2) - (-2)]^2 + [(2) - (5)]^2}$$

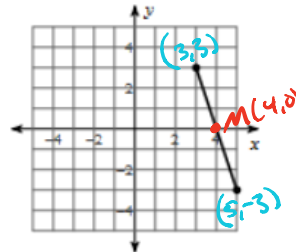
$$= \sqrt{[0]^2 + [-3]^2}$$

$$= \sqrt{0 + 9}$$

$$= \sqrt{9}$$

$$d = 3$$

4)



$$d = \sqrt{[\Delta x]^2 + [\Delta y]^2}$$

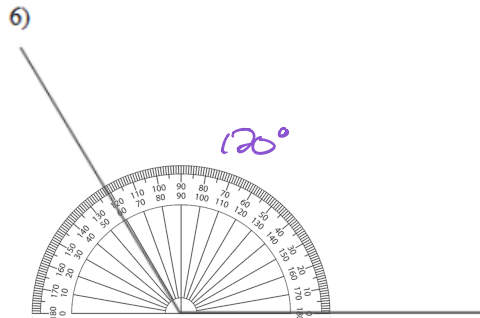
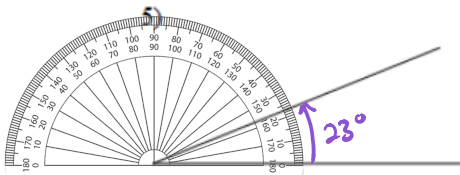
$$= \sqrt{[(3) - (5)]^2 + [(5) - (-3)]^2}$$

$$= \sqrt{[-2]^2 + [8]^2}$$

$$= \sqrt{4 + 64}$$

$$d = \sqrt{68}$$

Find the measure of each angle to the nearest degree. Classify the angle as obtuse, acute, straight, or right.



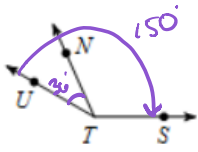
# Tools For Geometry

Review Chapter 1

Name \_\_\_\_\_

7)  $m\angle UTS = 150^\circ$  and  $m\angle UTN = 36^\circ$ .

Find  $m\angle NTS$ .



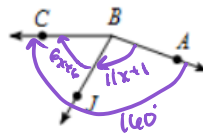
$$m\angle UTN + m\angle NTS = m\angle UTS$$

$$(36^\circ) + m\angle NTS = 150^\circ$$

$$m\angle NTS = 114^\circ$$

8)  $m\angle ABJ = 11x + 1$ ,  $m\angle ABC = 160^\circ$ ,

and  $m\angle JBC = 6x + 6$ . Find  $x$ .



$$m\angle CBJ + m\angle JBA = m\angle CBA$$

$$(6x+6) + (11x+1) = 160^\circ$$

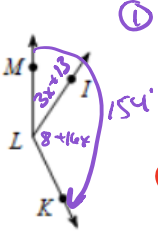
$$17x + 7 = 160$$

$$17x = 153$$

$$x = 9$$

9) Find  $m\angle MLI$  if  $m\angle MLK = 154^\circ$ ,

$m\angle MLI = 3x + 13$ , and  $m\angle ILK = 8 + 16x$ .



$$m\angle MLI + m\angle ILK = m\angle MLK$$

$$(3x+13) + (8+16x) = 154^\circ$$

$$19x + 21 = 154$$

$$19x = 133$$

$$x = 7$$

$$m\angle MLI = 3x + 13$$

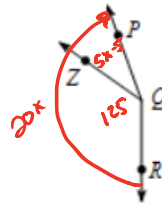
$$= 3(7) + 13$$

$$= 21 + 13$$

$$m\angle MLI = 34$$

10)  $m\angle ZQP = 5x - 5$ ,  $m\angle RQP = 20x$ ,

and  $m\angle RQZ = 125^\circ$ . Find  $m\angle RQP$ .



$$m\angle PQR + m\angle RQZ = m\angle PQR$$

$$(5x-5) + (125) = 20x$$

$$5x + 120 = 20x$$

$$120 = 15x$$

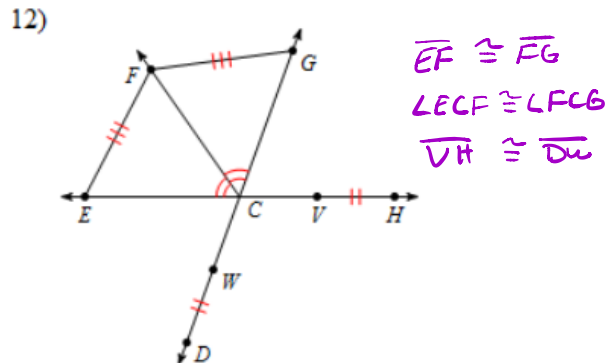
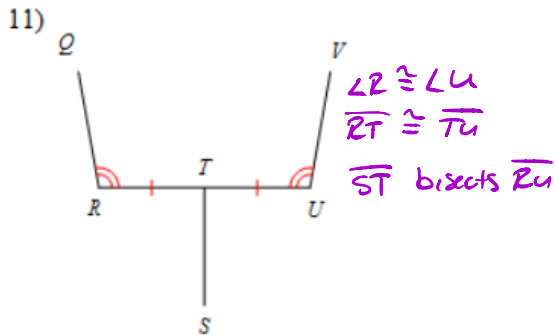
$$8 = x$$

$$m\angle RQP = 20x$$

$$= 20(8)$$

$$m\angle RQP = 160$$

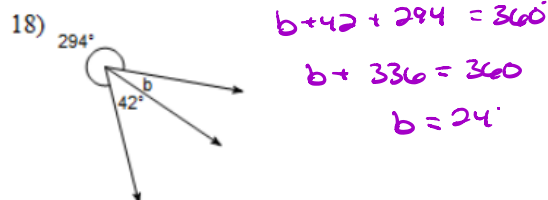
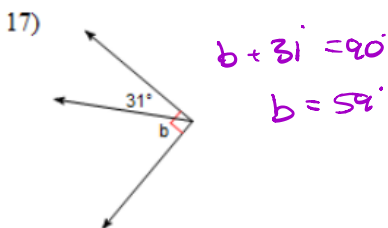
List all information given by the marks on the diagram.



Name the relationship: adjacent, complementary, linear pair (supplementary), or vertical angles

<p>13.</p> <p>vertical angles</p>	<p>14.</p> <p>Adjacent</p>	<p>15.</p> <p>linear pair adjacent</p>	<p>16.</p> <p>Complementary adjacent</p>
-----------------------------------	----------------------------	--	--

Find the measure of angle b.



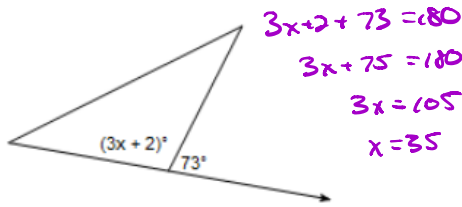
# Tools For Geometry

Review Chapter 1

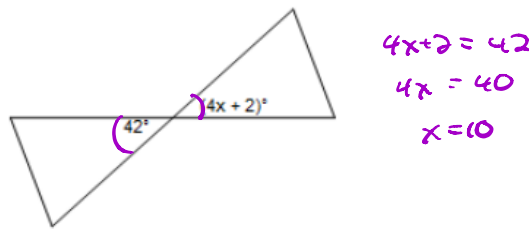
Name \_\_\_\_\_

Find the value of  $x$ .

19)



20)



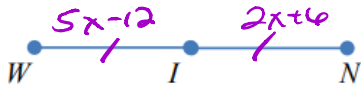
21.

Given

$I$  is the midpoint of  $\overline{WN}$

$WI = 5x - 12$

$IN = 2x + 6$



Find  $x$

$$\begin{aligned} WI &= IN \\ 5x - 12 &= 2x + 6 \\ 3x - 12 &= 6 \\ 3x &= 18 \\ x &= 6 \end{aligned}$$

Find  $WI$

$$\begin{aligned} WI &= 5x - 12 \\ &= 5(6) - 12 \\ &= 30 - 12 \\ WI &= 18 \end{aligned}$$

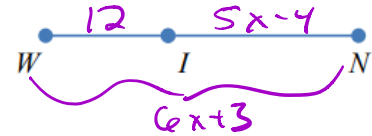
22.

Given

$WN = 6x + 3$

$WI = 12$

$IN = 5x - 4$



Find  $x$

$$\begin{aligned} WI + IN &= WN \\ (12) + (5x - 4) &= 6x + 3 \\ 5x + 8 &= 6x + 3 \\ 8 &= x + 3 \\ 5 &= x \end{aligned}$$

Find  $IN$

$$\begin{aligned} IN &= 5x - 4 \\ &= 5(5) - 4 \\ &= 25 - 4 \\ IN &= 21 \end{aligned}$$

## APPLICATIONS

### 1. Coordinate Geometry

- Graph the points  $A(4, 7)$  and  $B(0, 0)$  and  $C(8, 1)$
- Connect the points in order to make a triangle,  $\triangle ABC$

c. Find  $BA$ .

$$\begin{aligned} BA &= \sqrt{[\Delta x]^2 + [\Delta y]^2} \\ &= \sqrt{[(4) - (0)]^2 + [(7) - (0)]^2} \\ &= \sqrt{[4]^2 + [7]^2} \\ &= \sqrt{16 + 49} \\ BA &= \sqrt{65} \end{aligned}$$

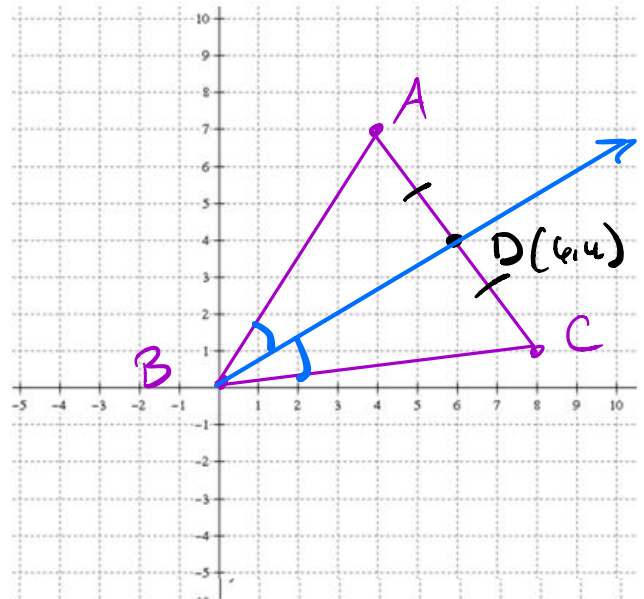
- d. Given  $BC = \sqrt{65}$ , what is true about  $BA$  and  $BC$ ?

$$BA = BC$$

- e. Find the midpoint of  $\overline{AC}$ . Plot on graph as point  $D$ .

$$M_{\overline{AC}} = \left( \frac{\sum x}{2}, \frac{\sum y}{2} \right) = \left( \frac{(4) + (8)}{2}, \frac{(7) + (1)}{2} \right) = \left( \frac{12}{2}, \frac{8}{2} \right) = (6, 4)$$

- f. Draw  $\overline{BD}$  on the graph.  $\overline{BD}$  is the angle bisector of  $\angle ABC$ . Mark the picture to show this.



# Tools For Geometry

Review Chapter 1

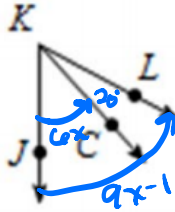
Name \_\_\_\_\_

## 2. Proof

Label the picture and fill in the missing reasons in the two column proof.

Given:  $m\angle CKJ = 6x$   
 $m\angle LKJ = 9x - 1$   
 $m\angle LKC = 20$

Prove:  $x = 7$



Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of \_\_\_\_\_
- \_\_\_\_\_ Postulate
- \_\_\_\_\_ Theorem

STATEMENT	REASON
1. $m\angle CKJ = 6x$ $m\angle LKJ = 9x - 1$ $m\angle LKC = 20$	1. Given
2. $m\angle CKJ + m\angle LKC = m\angle LKJ$	2. Angle Addition Postulate
3. $6x + 20 = 9x - 1$	3. Substitution Property of equality
4. $6x = 9x - 21$	4. Subtraction Property of equality
5. $-3x = -21$	5. Subtraction Property of equality
6. $x = 7$	6. Division Property of equality

## 3. Geometric Shape

Mr. Sullivan's dream home is in the shape of a pentagon. Help him answer the questions below.

Mark the picture with the following.

- $\overline{HY} \cong \overline{US}$
- $\overline{OE}$  is the bisector of  $\overline{HU}$
- $\angle HMO$  is a right angle
- $E$  is the midpoint of  $\overline{YS}$
- $\overline{OH} \cong \overline{OU}$
- $\angle OHU \cong \angle MUO$

Use the info to find the following.

- g. Given  $YE = 4x + 3$  and  $YS = 39$ , find  $x$ .

$$\begin{aligned}
 YE + ES &= YS \\
 (4x+3) + (4x+3) &= 39 \\
 8x + 6 &= 39 \\
 8x &= 33 \\
 x &= \frac{33}{8}
 \end{aligned}$$

- h. Given  $m\angle OHU = 4x + 3$  and  $m\angle MUO = 5x - 9$ , find  $x$  and  $m\angle MUO$

$$\begin{aligned}
 m\angle OHU &= m\angle MUO \\
 4x + 3 &= 5x - 9 \\
 3 &= x - 9 \\
 12 &= x
 \end{aligned}$$

$$\begin{aligned}
 m\angle MUO &= 5x - 9 \\
 &= 5(12) - 9 \\
 &= 60 - 9 \\
 m\angle MUO &= 51
 \end{aligned}$$

