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# Chapter 1 Notes

## Geometry

### Objectives

*To know the definitions of basic geometric figures.*

*To understand relationships between basic geometric figures.*

*To incorporate your algebra skills to solve basic geometric problems.*

*Points, lines and planes page 2*

*Segments page 4*

*Angles page 6*

*Angle Pairs page 8*

*Midpoint and Distance Formulas page 10*

*Basic Area Formulas page 12*

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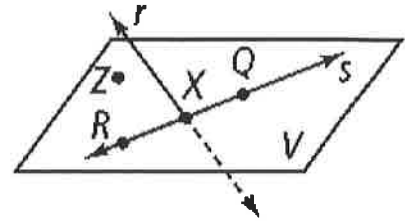
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### Naming Points, Lines and Planes

**Note:** Line  $r$  pierces the plane at  $X$ . It is not coplanar with  $V$ .

What are two ways to name  $\overleftrightarrow{QX}$ ?

What are two other ways to name plane  $V$ ?

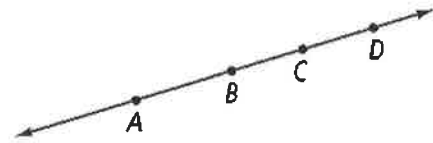


Name three collinear points.

Name four coplanar points.

### Naming Segments and Rays

Name six segments in the figure.



Name the rays in the figure.

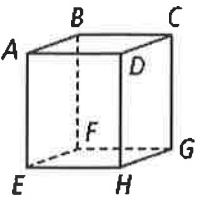
Name the pairs of opposite rays with endpoint  $C$ .

Name another pair of opposite rays.

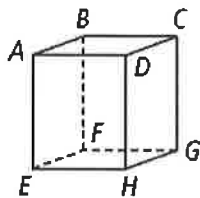
**Recognizing Planes**

Shade the plane that contains the given points.

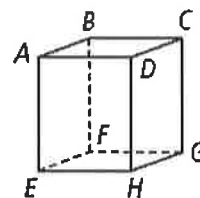
$A, B, C$



$C, D, H$



$E, H, G$



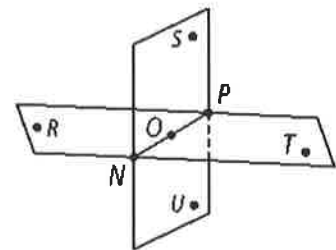
Give the plane that contains the first three points listed. Then determine whether the fourth point is in that plane. Write *coplanar* or *noncoplanar* to describe the points.

$P, T, R, N$

$P, O, S, N$

$T, R, N, U$

$P, O, R, S$



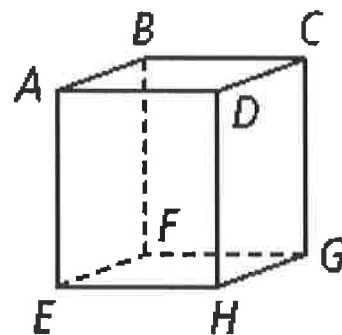
**Finding the Intersection of two Planes**

Name the intersection of each pair of planes.

Planes  $DCG$  and  $EFG$

Planes  $BCG$  and  $ABF$

Planes  $EFG$  and  $ADH$



Name two planes that intersect at the given line.

$\overleftrightarrow{CD}$

$\overleftrightarrow{DH}$

$\overleftrightarrow{EF}$

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**VERY IMPORTANT RULE:** When values are given for \_\_\_\_\_  
you must \_\_\_\_\_ the diagram.

**Using the Segment Addition Postulate**

If  $GH = 31$  and  $HI = 11$ , then  $GI =$  \_\_\_\_\_.



If  $GH = 45$  and  $GI = 61$ , then  $HI =$  \_\_\_\_\_.



$GH = 7y + 3$ ,  $HI = 3y - 5$ , and  $GI = 9y + 7$ .



What is the value of  $y$ ?

Find  $GH$ ,  $HI$  and  $GI$ .

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$HI = 4x + 10$ ,  $GI = 3HI$ , and  $GH = 40$

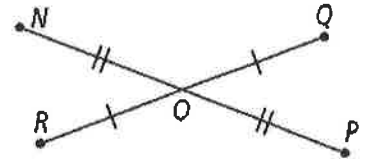


What is the value of  $x$ ?

Find  $GH$ ,  $HI$  and  $GI$ .

### Using the Midpoint

If  $NO = 17$  and  $NP = 5x - 6$ , find the value of  $x$ . Then find  $NP$  and  $OP$ .



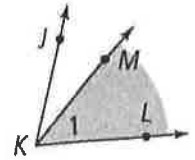
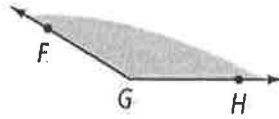
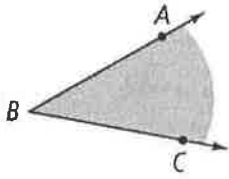
If  $RO = 6 + x$  and  $OQ = 2x + 1$  find the value of  $x$ . Then find  $RO$ ,  $OQ$  and  $RQ$ .

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### Naming Angles

Name each shaded angle in three different ways.



### Measuring and Classifying Angles

Use the diagram to find the measure of each angle. Also, classify each angle as *right*, *acute*, *obtuse* or *straight*.

$\angle AFB$

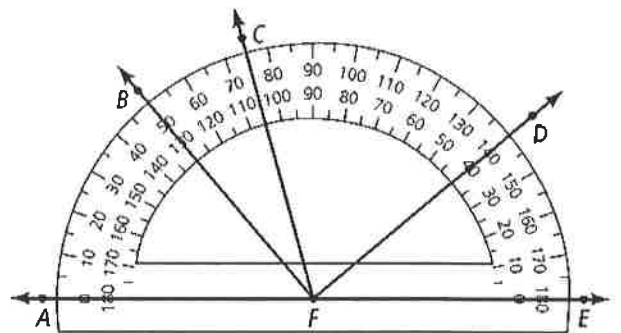
$\angle AFD$

$\angle CFD$

$\angle BFD$

$\angle AFE$

$\angle BFE$



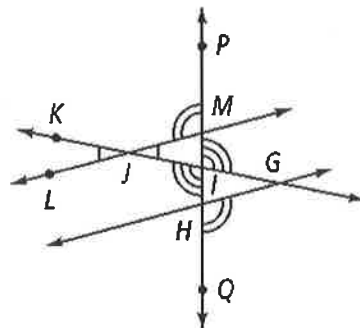
### Using Congruent Angles

$\angle MIG \cong$

$\angle PMJ \cong$

If  $m\angle KJL = 30$ , then  $m\angle \underline{\hspace{2cm}} = 30$

If  $m\angle LMP = 100$ , then  $m\angle QHG = \underline{\hspace{2cm}}$

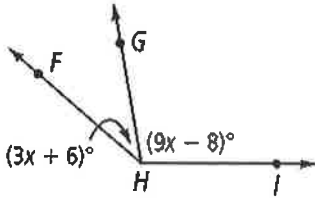


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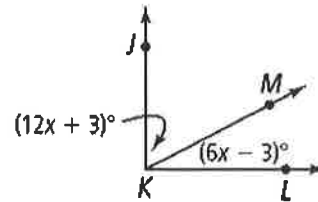
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### Using the Angle Addition Postulate

If  $m\angle FHI = 142$ , what are  $m\angle FHG$  and  $m\angle GHI$ ?

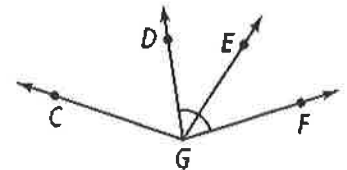


$\angle JKL$  is a right angle. What are  $m\angle JKM$  and  $m\angle MKL$ ?



$m\angle CGD = 4x + 2$ ,  $m\angle DGE = 3x - 5$ ,  $m\angle EGF = 2x + 10$

Find  $x$ .



$m\angle CGD = 2x - 2$ ,  $m\angle EGF = 37$ ,  $m\angle CGF = 7x + 2$

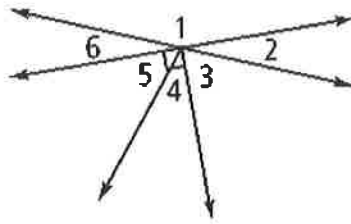
Find  $x$ .

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### Identifying Angle Pairs

Is each statement true? Explain.



$\angle 5$  and  $\angle 4$  are supplementary.

$\angle 6$  and  $\angle 5$  are adjacent.

$\angle 1$  and  $\angle 2$  are a linear pair.

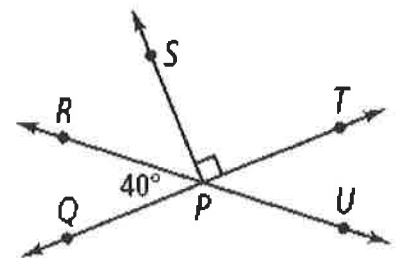
Name a pair of vertical angles.

Name an angle supplementary to  $\angle RPS$ .

Name a linear pair.

Name a pair of complementary angles.

Name an angle adjacent to  $\angle TPU$ .



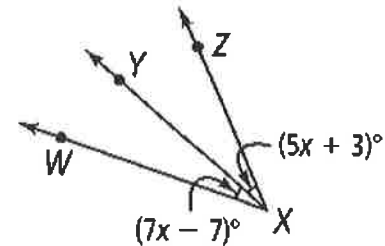


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**Using an Angle Bisectors and Linear Pairs to find Angle Measures**

In the diagram,  $XY$  bisects  $\angle WXZ$ . Solve for  $x$  and find  $m\angle WXY$ ,  $m\angle YXZ$  and  $m\angle WXZ$ .



$\overline{QR}$  bisects  $\angle PQS$ . Solve for  $x$  and find  $m\angle PQS$ .

$$m\angle PQR = 3x, m\angle RQS = 4x - 9$$

$$m\angle PQS = 4x - 6, m\angle PQR = x + 11$$

$\angle ABD$  and  $\angle DBC$  are a linear pair. Solve for  $x$  and find  $m\angle ABD$  and  $m\angle DBC$ .

$$m\angle ABD = 10x \text{ and } m\angle DBC = 8x$$

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### Finding the Midpoint

$\overline{GH}$  has endpoints (6, 5) and (10, 14). What are the coordinates of its midpoint  $M$ ?

$\overline{QR}$  has endpoints (-20, -3) and (-1, 0). What are the coordinates of its midpoint  $M$ ?

### Finding an Endpoint

The midpoint of  $\overline{EF}$  has coordinates (4, -9). Endpoint  $E$  has coordinates (-3, -5). What are the coordinates of  $F$ ?

The midpoint of  $\overline{TU}$  has coordinates (-2, -6). Endpoint  $T$  has coordinates (12, -8). What are the coordinates of  $U$ ?

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### Finding Distance

$\overline{JK}$  has endpoints  $J(5, -12)$  and  $K(3, 4)$ . What is  $JK$  to the nearest tenth?

$\overline{PQ}$  has endpoints  $P(0, 8)$  and  $Q(-11, 10)$ . What is  $PQ$  to the nearest tenth?

### Finding Perimeter in the Coordinate Plane

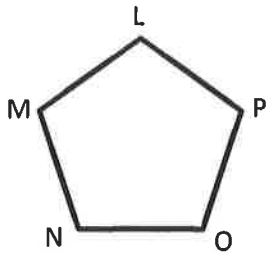
Find the perimeter of  $QRST$ .

$Q(-1, 0)$ ,  $R(2, 3)$ ,  $S(3, -3)$ ,  $T(-1, 3)$

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Name the polygon, then identify its sides and angles.



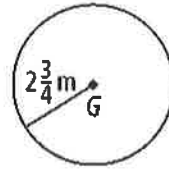
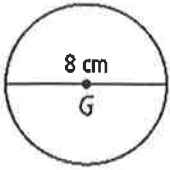
Name 2 ways:

Sides:

Angles:

### Finding Circumference

Find the circumference and area of circle  $G$  in terms of  $\pi$ .



### Finding Area

Find the area of each rectangle with the given base and height.

3 ft., 8 in.

8ft.6in., 2 ft.

Find the area of the shaded region. All angles are right angles.

