

For the Quiz Friday, you should be able to:

- ✓ Identify parts of an angle (Section 1.4)
- ✓ Name, measure, and classify angles (Section 1.4)
- ✓ Use Angle Addition Postulate to find measures of angles (Section 1.4)
- ✓ Use angle bisectors to find measures of angles (Section 1.4)
- ✓ Identify adjacent angles, complementary angles, supplementary angles, vertical angles, and linear pairs. (Section 1.5)
- ✓ Find measures of complementary angles, supplementary angles, vertical angles, and linear pair angles. (Section 1.5 and 2.7)

1. Use the diagram below to complete the following:

a) Give 3 names for the angle.

$\angle NQT, \angle TQN, \angle Q$

b) Identify the vertex of the angle.

Point Q

c) Identify the sides of the angle.

\vec{QN}, \vec{QT}



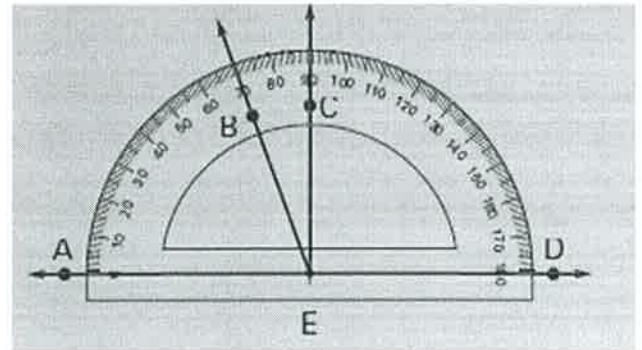
2. Use the diagram to find the measure of each angle and classify the angle.

a) $m\angle DEC = 90^\circ$, Right

b) $m\angle DEA = 180^\circ$, Straight

c) $m\angle CEB = 20^\circ$, acute

d) $m\angle DEB = 110^\circ$, Obtuse



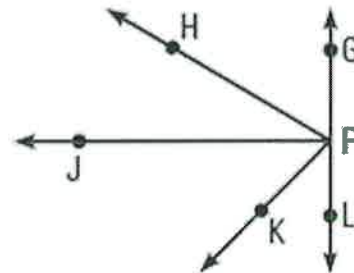
3. Extend the rays as needed. Use a protractor to find the measure of the given angle. Then classify the angle as acute, obtuse, right, or straight.

a) $m\angle JFL = 90^\circ$, right

b) $m\angle GFH = 60^\circ$, acute

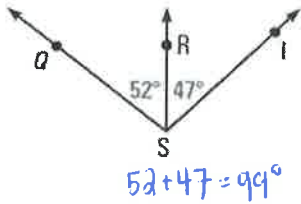
c) $m\angle GFK = 135^\circ$, obtuse

d) $m\angle GFL = 180^\circ$, straight



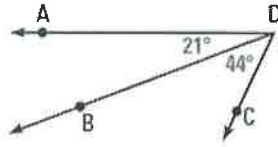
4. Find the indicated angle measures.

a) $m\angle QST = 99^\circ$



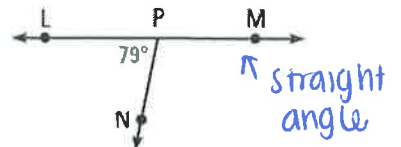
$52 + 47 = 99^\circ$

b) $m\angle ADC = 65^\circ$



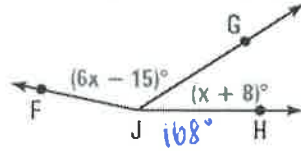
$21 + 44 = 65^\circ$

c) $m\angle NPM = 101^\circ$



$180 - 79 = 101^\circ$

5. Given $m\angle FJH = 168^\circ$, find $m\angle FJG$.



little + little = big

$6x - 15 + x + 8 = 168$

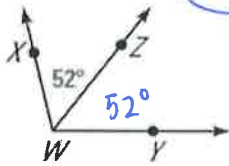
$7x - 7 = 168$

$7x = 175 \Rightarrow x = 25$

$m\angle FJG = 6(25) - 15$

$m\angle FJG = 135^\circ$

6. Given that \overline{WZ} bisects $\angle XWY$, find the measure of $\angle XWY$.

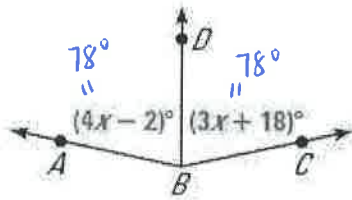


each half is the same

$m\angle XWY = 52 + 52$

$m\angle XWY = 104^\circ$

7. Given that \overline{BD} bisects $\angle ABC$, find $m\angle ABC$.



$4x - 2 = 3x + 18$

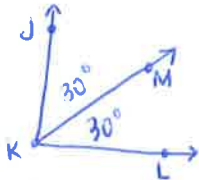
$x - 2 = 18$

$x = 20$

$m\angle ABC = 78 + 78$

$m\angle ABC = 156^\circ$

8. **Error Analysis** \overline{KM} bisects $\angle JKL$, and $m\angle JKM = 30^\circ$. Describe and correct the error made in stating that $m\angle JKL = 15^\circ$. Draw a sketch to support your answer.



Since \overline{KM} bisects the angle, each half of the angle should be the same, which means that each half should be 30° . Using the angle addition, the whole angle $\angle JKL$ should be $30 + 30 = 60^\circ$.

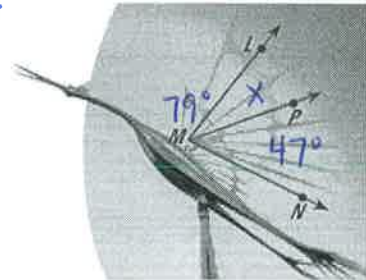
9. In the sculpture shown in the photograph, suppose the measure of $\angle LMN$ is 79° and the measure of $\angle PMN$ is 47° . What is the measure of $\angle LMP$?

little + little = big

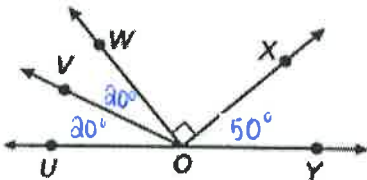
$x + 47 = 79$

$x = 32$

$m\angle LMP = 32^\circ$



10. In the diagram below, \overline{OV} bisects $\angle UOW$, and $m\angle UOV = 20^\circ$. Find $m\angle XOY$ and $m\angle WOY$.

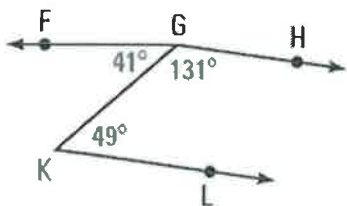


$m\angle XOY = 50^\circ$

$m\angle WOY = 90 + 50$

$m\angle WOY = 140^\circ$

11. In the figure, name a pair of complementary angles, a pair of supplementary angles, and a pair of adjacent angles.



Adjacent: $\angle FGK$ and $\angle KGH$ (share side \vec{GK})

Complementary: $\angle FGK$ and $\angle GKL$ since $41 + 49 = 90^\circ$

Supplementary: $\angle KGH$ and $\angle GKL$ since $131 + 49 = 180^\circ$

12. $\angle 1$ and $\angle 2$ are complementary angles. If $m\angle 1 = 43^\circ$, what is $m\angle 2$?

$$m\angle 1 + m\angle 2 = 90 \Rightarrow 43 + m\angle 2 = 90 \Rightarrow \boxed{m\angle 2 = 47^\circ}$$

13. $\angle 1$ and $\angle 2$ are supplementary angles. If $m\angle 1 = 27^\circ$, what is $m\angle 2$?

$$m\angle 1 + m\angle 2 = 180 \Rightarrow 27 + m\angle 2 = 180 \Rightarrow \boxed{m\angle 2 = 153^\circ}$$

14. $\angle A$ and $\angle B$ are complementary angles. Find the measures of $\angle A$ and $\angle B$, if $m\angle A = (11x + 24)^\circ$ and $m\angle B = (x + 18)^\circ$.

$$m\angle A + m\angle B = 90$$

$$11x + 24 + x + 18 = 90$$

$$12x + 42 = 90$$

$$12x = 48 \Rightarrow \boxed{x = 4}$$

$$m\angle A = 11(4) + 24$$

$$\boxed{m\angle A = 68^\circ}$$

$$m\angle B = 4 + 18$$

$$\boxed{m\angle B = 22^\circ}$$

15. $\angle A$ and $\angle B$ are supplementary angles. Find the measures of $\angle A$ and $\angle B$, if $m\angle A = (2x - 20)^\circ$ and $m\angle B = (3x + 5)^\circ$.

$$m\angle A + m\angle B = 180$$

$$2x - 20 + 3x + 5 = 180$$

$$5x - 15 = 180$$

$$5x = 195 \Rightarrow \boxed{x = 39}$$

$$m\angle A = 2(39) - 20$$

$$\boxed{m\angle A = 58^\circ}$$

$$m\angle B = 3(39) + 5$$

$$\boxed{m\angle B = 122^\circ}$$

16. The measure of an angle is 3 times the measure of its complement. Find the measures of the two angles.

$$x = 3(90 - x)$$

$$x = 270 - 3x$$

$$4x = 270$$

$$\boxed{x = 67.5^\circ}$$

$$\text{its complement: } 90 - 67.5 = \boxed{22.5^\circ}$$

17. Two angles form a linear pair. The measure of one angle is 4 times the measure of the other angle. Find the measure of each angle.

$$x = 4y$$

$$x + y = 180$$

$$x = 4y$$

substitute into 1st equation

$$4y + y = 180$$

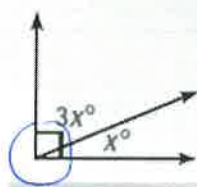
$$5y = 180$$

$$y = 36$$

$$\boxed{\text{one angle} = 36^\circ}$$

$$\boxed{\text{other angle} = 180 - 36 = 144^\circ}$$

18. **Error Analysis** Describe and correct then error made in finding the value of x .



↑
the angle is 90°

$$x^\circ + 3x^\circ = 180^\circ$$

$$4x = 180$$

$$x = 45$$



These two angles are complementary, which means they should add up to 90° instead of 180° .

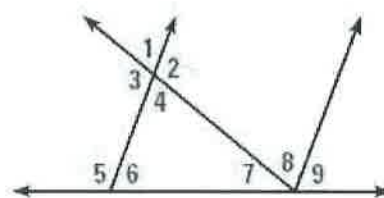
$$x + 3x = 90$$

$$4x = 90$$

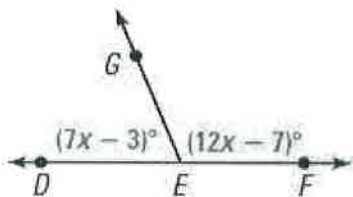
$$\boxed{x = 22.5}$$

19. Use the diagram to tell whether the angles are *vertical angles*, a *linear pair*, or *neither*.

- | | |
|--|---|
| a) $\angle 1$ and $\angle 4$
Vertical | b) $\angle 1$ and $\angle 2$
Linear Pair |
| c) $\angle 3$ and $\angle 5$
Neither | d) $\angle 2$ and $\angle 3$
Vertical |
| e) $\angle 7, \angle 8,$ and $\angle 9$
Neither | f) $\angle 5$ and $\angle 6$
Linear Pair |
| g) $\angle 6$ and $\angle 7$
Neither | h) $\angle 5$ and $\angle 9$
Neither |



20. Find the measures of $\angle DEG$ and $\angle GEF$.



$$7x - 3 + 12x - 7 = 180$$

$$19x - 10 = 180$$

$$19x = 190$$

$$x = 10$$

$$m\angle DEG = 7(10) - 3$$

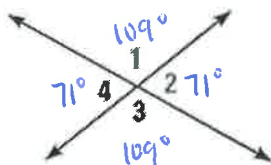
$$m\angle DEG = 67^\circ$$

$$m\angle GEF = 12(10) - 7$$

$$m\angle GEF = 113^\circ$$

straight angle

21. In the diagram below, if $m\angle 4 = 71^\circ$, find $m\angle 1$, $m\angle 2$, and $m\angle 3$.



$$m\angle 2 = 71^\circ \text{ (angle 4 and 2 are vertical)}$$

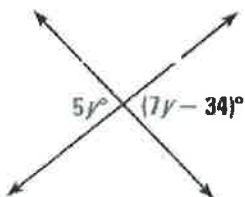
$$m\angle 1 + m\angle 2 = 180 \text{ (linear pair)}$$

$$m\angle 1 + 71 = 180$$

$$m\angle 1 = 109^\circ$$

$$m\angle 3 = 109^\circ \text{ (angle 1 and 3 are vertical)}$$

22. Find the value of y .

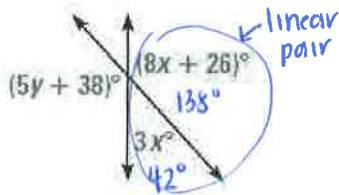


$$5y = 7y - 34$$

$$-2y = -34$$

$$y = 17$$

23. Find the values of x and y .



$$8x + 26 + 3x = 180$$

$$11x + 26 = 180$$

$$11x = 154$$

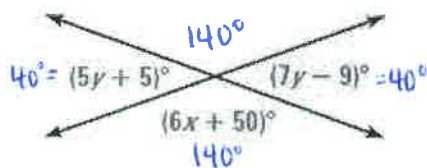
$$x = 14$$

$$5y + 38 = 138 \text{ (vertical angles)}$$

$$5y = 100$$

$$y = 20$$

24. Find the values of x and y . Then find the measures of each angle.



$$5y + 5 = 7y - 9$$

$$5 = 2y - 9$$

$$14 = 2y$$

$$y = 7$$

$$40 + 6x + 50 = 180$$

$$6x + 90 = 180$$

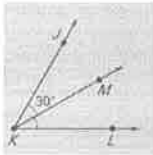
$$6x = 90$$

$$x = 15$$

$$\text{angles: } 40^\circ, 140^\circ, 40^\circ, 140^\circ$$

Answer Key

1. a) $\angle NQT, \angle TQN, \angle Q$; Vertex: Q ; Sides \overrightarrow{QN} and \overrightarrow{QT}
2. a) 90° , right b) 180° , straight c) 20° , acute d) 110° obtuse
3. a) 90° , right b) 60° , acute c) 135° , obtuse d) 180° , straight
4. a) 99° b) 65° c) 101°
5. 135°
6. 104°
7. 156°
8. To find $m\angle JKL$, $m\angle JKM$ should be doubled, not halved. $m\angle JKL = 60^\circ$.



- * 9. 34°
10. $50^\circ, 140^\circ$
 11. $\angle FGK$ and $\angle GKL$; $\angle HGK$ and $\angle GKL$; $\angle FGK$ and $\angle HGK$
 12. 47°
 13. 153°
 14. 68° and 22°
 15. 58° and 122°
 16. 22.5° and 67.5°
 17. 36° and 144°
 18. The angles are complementary so they should be equal to 90° . $x + 3x = 90$, $4x = 90$, $x = 22.5$
 19. a) vertical angles b) linear pair c) neither d) vertical angles
e) neither f) linear pair g) neither h) neither
 20. 67° and 113°
 21. $109^\circ, 71^\circ$, and 109°
 22. $y = 17$
 23. $x = 14, y = 20$
 24. $x = 15, y = 7, 140^\circ, 40^\circ, 140^\circ$, and 40°