

Solve the equation to find the value of the variable.

$$1. x^\circ + 40^\circ = 110^\circ$$

$$-40 \quad -40$$

$$x = 70^\circ$$

$$2. r^\circ - 44^\circ = 135^\circ$$

$$+44^\circ +44^\circ$$

$$r = 179^\circ$$

$$3. n^\circ - 19^\circ = 125^\circ$$

$$+19 \quad +19$$

$$n = 144^\circ$$

$$4. y^\circ - 55^\circ = 35^\circ$$

$$+55 \quad +55$$

$$y = 90^\circ$$

$$5. 2t^\circ + 10^\circ = 140^\circ$$

$$-10 \quad -10$$

$$\frac{2t}{2} = \frac{130}{2}$$

$$t = 65^\circ$$

$$6. 2w^\circ - 65^\circ = 175^\circ$$

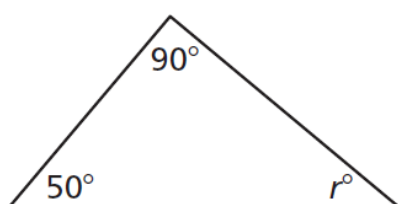
$$+65 \quad +65$$

$$\frac{2w}{2} = \frac{240}{2}$$

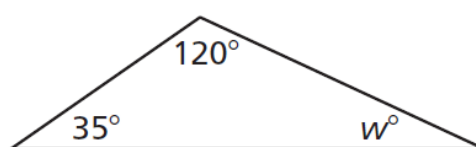
$$w = 120$$

Find the value of the variable.

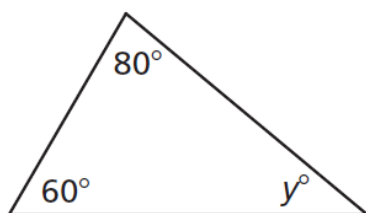
1.



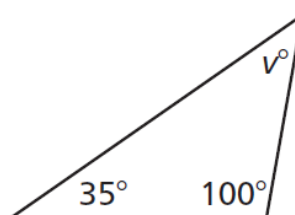
2.



3.



4.



Essential Question

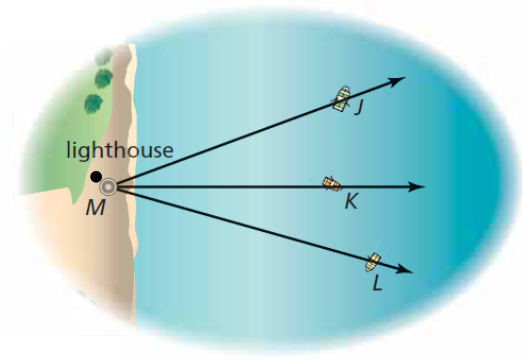
How can you measure and classify an angle?

Q

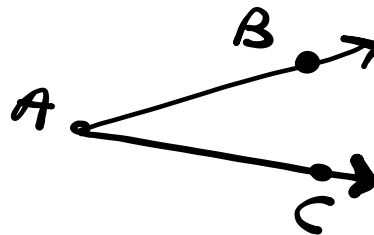
Notes

Summary:

A lighthouse keeper measures the angles formed by the lighthouse at point M and three boats. Name three angles shown in the diagram.

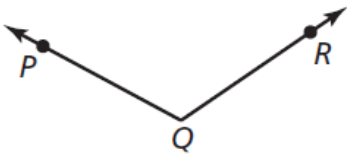


$\angle JMK$ $\angle KML$
 $\angle JML$ $\angle LMK$
 $\angle LMK$ $\angle KML$



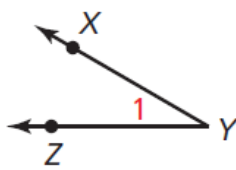
Write three names for the angle.

1.



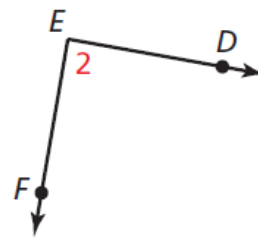
$\angle PQR$
 $\angle Q$
 $\angle RQP$

2.



$\angle XYZ$
 $\angle ZYX$
 $\angle Y$
 $\angle 1$

3.



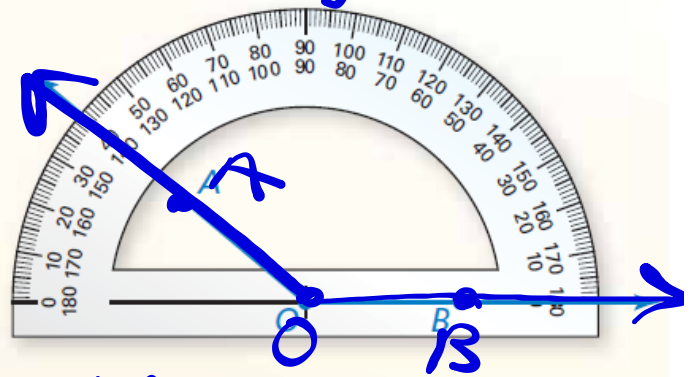
$\angle E$
 $\angle 2$
 $\angle FED$
 $\angle DEF$

Postulate

Ruler - Segments
 Protractor - Angles

Consider \overrightarrow{OB} and a point A on one side of \overrightarrow{OB} . The rays of the form \overrightarrow{OA} can be matched one to one with the real numbers from 0 to 180.

The **measure** of $\angle AOB$, which can be written as $m\angle AOB$, is equal to the absolute value of the difference between the real numbers matched with \overrightarrow{OA} and \overrightarrow{OB} on a protractor.

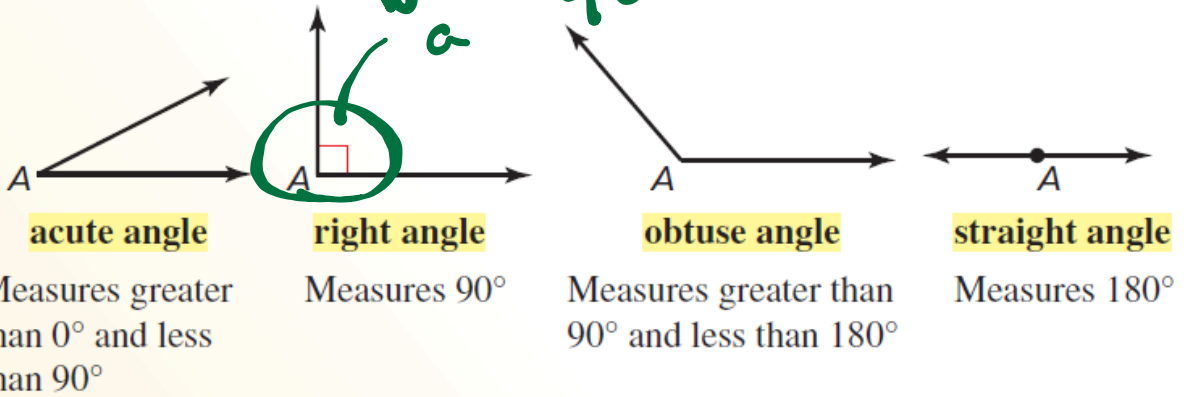


$\angle AOB$

$m\angle AOB$

Core Concept

Types of Angles



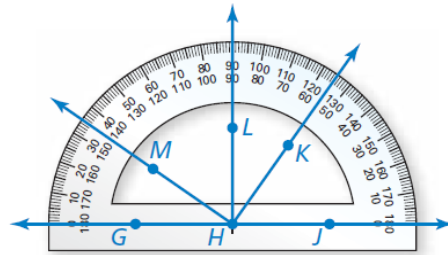
Designates a 90° angle

$0 < \angle A < 90^\circ$ $90^\circ < \angle A < 180^\circ$

Find the measure of each angle.

Then classify each angle.

a. $\angle GHK$ b. $\angle JHL$ c. $\angle LHK$



Obtuse \angle 90° Acute \angle
 Right \angle

Use the diagram to find the angle measure. Then classify the angle.

4. $\angle JHM$

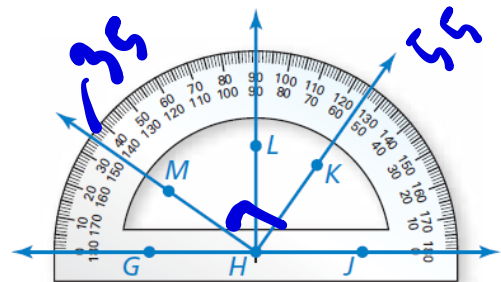
Obtuse

5. $\angle MHK$

Right \angle

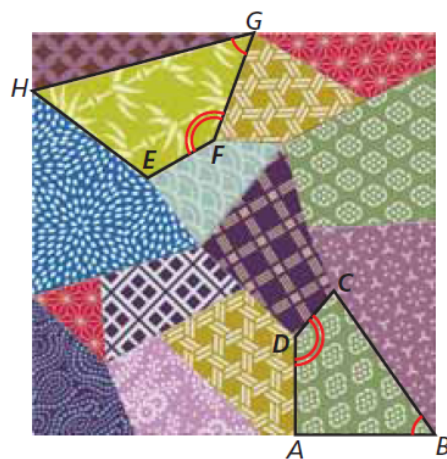
6. $\angle MHL$

Acute

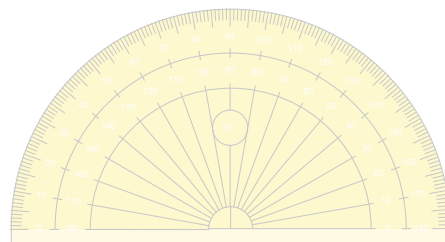
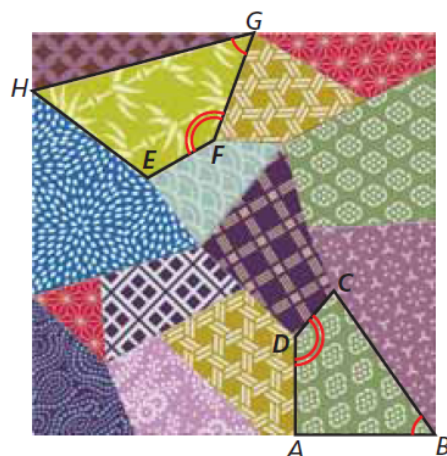


Copying an Angle

- a. Identify the congruent angles labeled in the quilt design.
- b. $m\angle ADC = 140^\circ$. What is $m\angle EFG$?



7. Without measuring, is $\angle DAB \cong \angle FEH$ in Example 3? Explain your reasoning. Use a protractor to verify your answer.



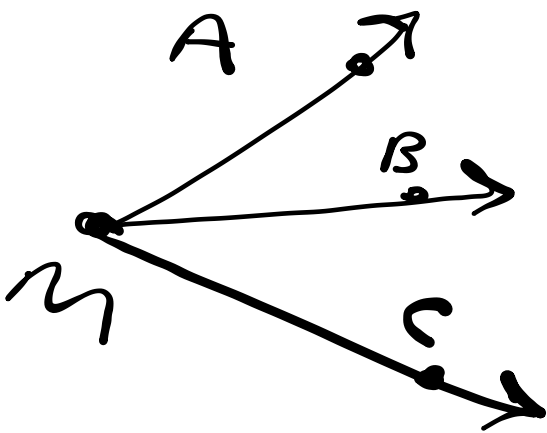
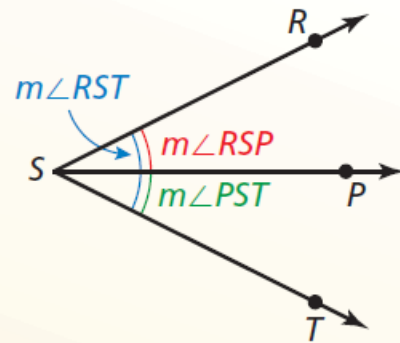
Postulate

Postulate 14 Angle Addition Postulate

Words If P is in the interior of $\angle RST$, then the measure of $\angle RST$ is equal to the sum of the measures of $\angle RSP$ and $\angle PST$.

Symbols If P is in the interior of $\angle RST$, then

$$m\angle RST = m\angle RSP + m\angle PST.$$



$$\angle AMB + \angle BMC = \angle AMC$$

Given that $m\angle LKN = 145^\circ$, find $m\angle LKM$ and $m\angle MKN$.

$$m\angle LKM + m\angle MKN = m\angle LKN$$

$$\underline{2x + 10} + \underline{4x - 3} = 145^\circ$$

$$6x + 7 = 145$$

$$\quad -7 \quad -7$$

$$\frac{6x}{6} = \frac{138}{6}$$

$$x = 23$$

$$m\angle LKM$$

$$2(23) + 10$$

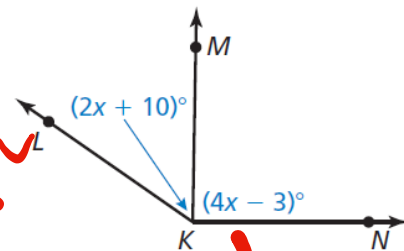
$$= 56^\circ$$

$$m\angle MKN$$

$$4x - 3$$

$$4(23) - 3$$

$$= 89^\circ$$

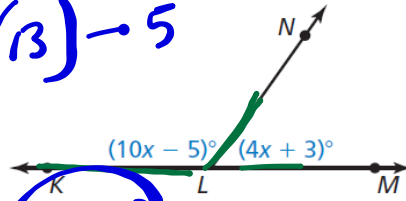


$$m\angle LKN = 145^\circ$$

Find the indicated angle measures.

8. Given that $\angle KLM$ is a straight angle, find $m\angle KLN$ and $m\angle NLM$.

$10(13) - 5$



125°

$52 + 3$
 55

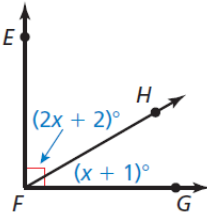
$10x - 5 + 4x + 3 = 180^\circ$

$14x - 2 = 180^\circ$

$14x = 182^\circ$

$x = 13$

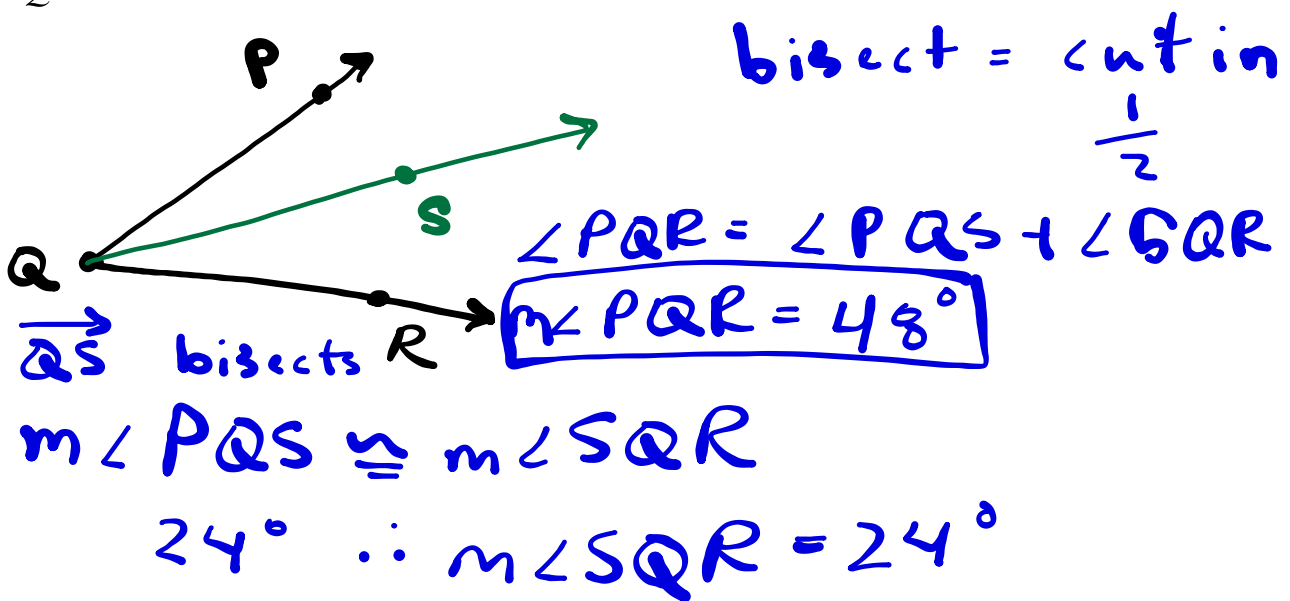
9. Given that $\angle EFG$ is a right angle, find $m\angle EFH$ and $m\angle HFG$.



$m\angle KLN = 125^\circ$

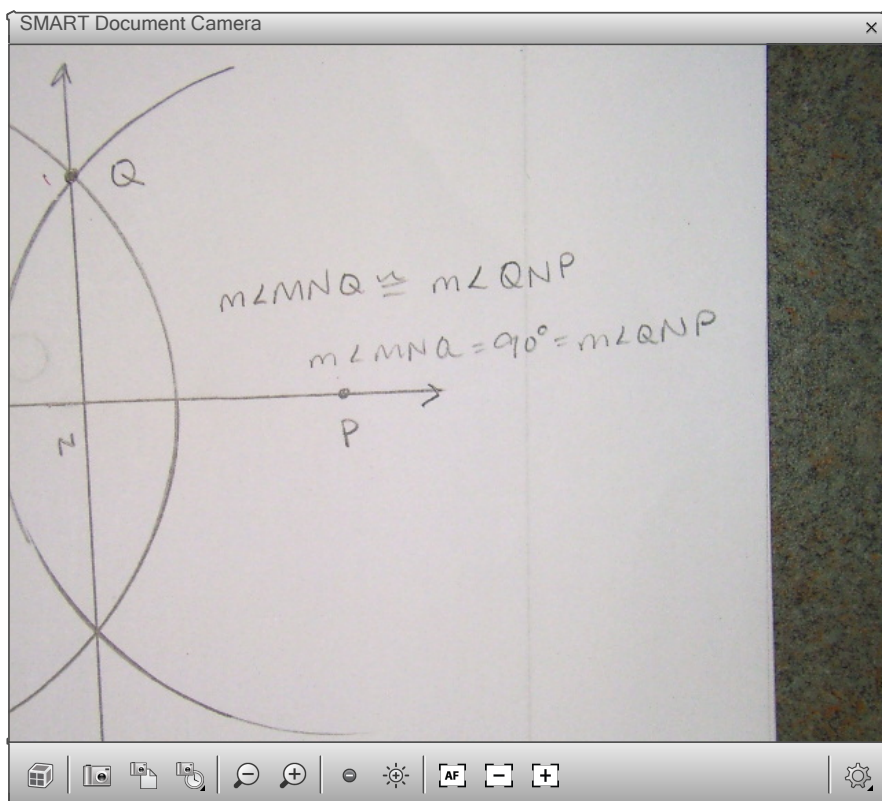
$m\angle NLM = 55^\circ$

\overrightarrow{QS} bisects $\angle PQR$, and $m\angle PQS = 24^\circ$. Find $m\angle PQR$.

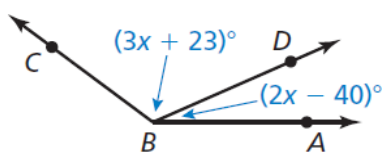


Construction: Bisecting an Angle

10. Angle MNP is a straight angle, and \overline{NQ} bisects $\angle MNP$. Draw $\angle MNP$ and \overline{NQ} . Use arcs to mark the congruent angles in your diagram. Find the angle measures of these congruent angles.



Exit Ticket: Given that $m\angle ABC = 143^\circ$, find $m\angle ABD$ and $m\angle DBC$.



$$3x + 23 + 2x - 40 = 143$$

$$\begin{array}{r} 5x + 17 = 143 \\ -17 \quad -17 \end{array}$$

$$\frac{5x}{5} = \frac{126}{5}$$

$$x = 25.2^\circ$$

p 43 # 7, 8, 25-32
37, 40, 42, 48