



Lesson 1.5 Measuring and Constructing Angles

Learning Intent (Target): *Today I will* be able to measure and classify angles.

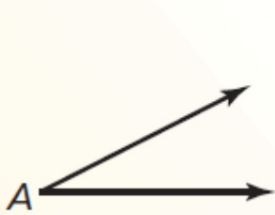
Success Criteria: *I'll know I'll have it when I'll* be able to use the angle addition postulate to determine angle measures.

Accountable Team Task: *Therefore, I can* practice using postulates from interactive flip charts and apply it to problem solving.



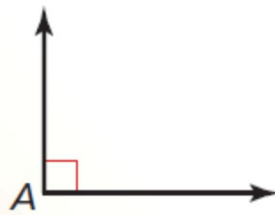
Core Concept

Types of Angles



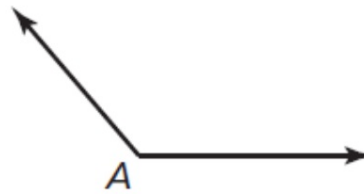
acute angle

Measures greater than 0° and less than 90°



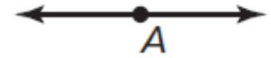
right angle

Measures 90°



obtuse angle

Measures greater than 90° and less than 180°



straight angle

Measures 180°

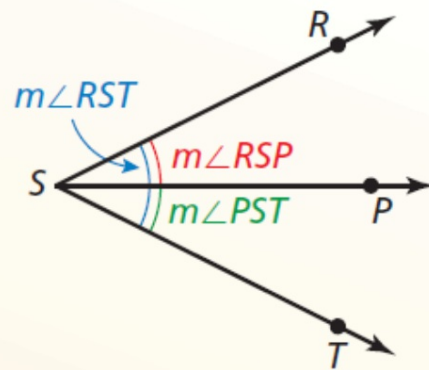
Postulate

Postulate 1.4 Angle Addition Postulate

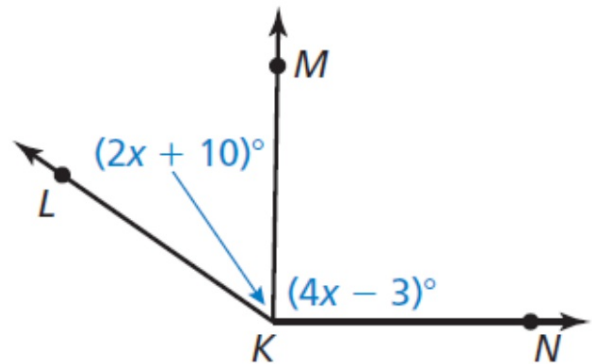
Words If P is in the interior of $\angle RST$, then the measure of $\angle RST$ is equal to the sum of the measures of $\angle RSP$ and $\angle PST$.

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

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



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



SOLUTION

Step 1 Write and solve an equation to find the value of x .

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

Angle Addition Postulate

$$145^\circ = (2x + 10)^\circ + (4x - 3)^\circ$$

Substitute angle measures.

$$145 = 6x + 7$$

Combine like terms.

$$138 = 6x$$

Subtract 7 from each side.

$$23 = x$$

Divide each side by 6.

Step 2 Evaluate the given expressions when $x = 23$.

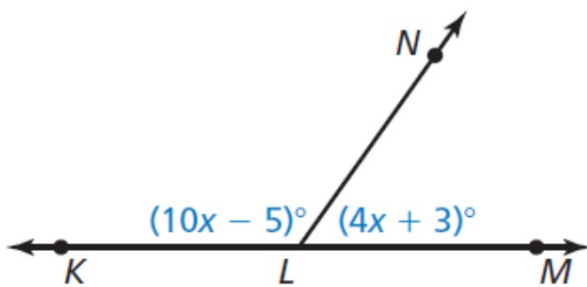
$$m\angle LKM = (2x + 10)^\circ = (2 \cdot 23 + 10)^\circ = 56^\circ$$

$$m\angle MKN = (4x - 3)^\circ = (4 \cdot 23 - 3)^\circ = 89^\circ$$

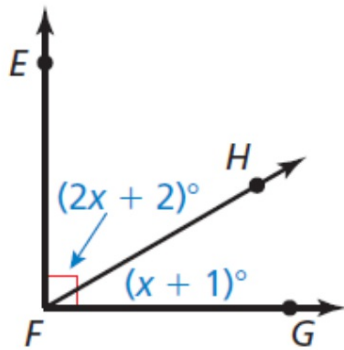
► So, $m\angle LKM = 56^\circ$, and $m\angle MKN = 89^\circ$.

Find the indicated angle measures.

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



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



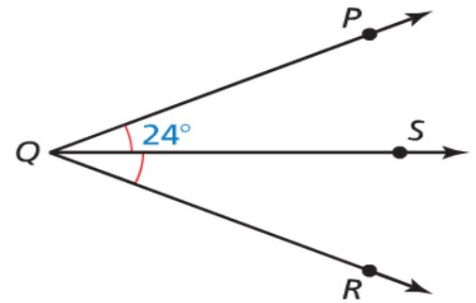
8. Given that $\angle KLM$ is a straight angle,
find $m\angle KLN$ and $m\angle NLM$. $125^\circ, 55^\circ$

9. Given that $\angle EFG$ is a right angle,
find $m\angle EFH$ and $m\angle HFG$. $60^\circ, 30^\circ$

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

SOLUTION

Step 1 Draw a diagram.



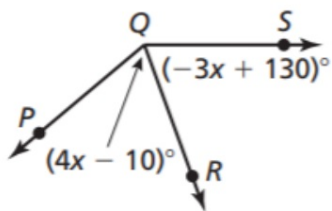
Step 2 Because \overrightarrow{QS} bisects $\angle PQR$, $m\angle PQS = m\angle RQS$. So, $m\angle RQS = 24^\circ$. Use the Angle Addition Postulate to find $m\angle PQR$.

$$\begin{aligned} m\angle PQR &= m\angle PQS + m\angle RQS \\ &= 24^\circ + 24^\circ \\ &= 48^\circ \end{aligned}$$

Angle Addition Postulate
Substitute angle measures.
Add.

► So, $m\angle PQR = 48^\circ$.

9. \overline{QR} bisects $\angle PQS$.
Find $m\angle PQR$ and
 $m\angle PQS$.



$$\begin{array}{r} -3x + 130 = 4x - 10 \\ +3x \quad \quad +3x \end{array}$$

$$\begin{array}{r} 130 = 7x - 10 \\ +10 \quad \quad +10 \end{array}$$

$$\begin{array}{r} 140 = 7x \\ 7 \quad 7 \end{array}$$

$$20 = x$$

Next substitute in 20 for x for each angle

$$4(20) - 10 = 80 - 10 = 70 \text{ for angle } PQR$$

$$-3(20) + 130 = -60 + 130 = 70 \text{ for angle } SQR$$

$$\text{the entire angle } PQS = 70 + 70 = 140$$