

4-2 Enrichment

Finding Angle Measures in Triangles

You can use algebra to solve problems involving triangles.

Example In triangle ABC , $m\angle A$ is twice $m\angle B$, and $m\angle C$ is 8 more than $m\angle B$. What is the measure of each angle?

Write and solve an equation. Let $x = m\angle B$.

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

$$2x + x + (x + 8) = 180$$

$$4x + 8 = 180$$

$$4x = 172$$

$$x = 43$$

So, $m\angle A = 2(43)$ or 86 , $m\angle B = 43$, and $m\angle C = 43 + 8$ or 51 .

Solve each problem.

1. In triangle DEF , $m\angle E$ is three times $m\angle D$, and $m\angle F$ is 9 less than $m\angle E$. What is the measure of each angle?

$$m\angle D = 27, m\angle E = 81, m\angle F = 72$$

2. In triangle RST , $m\angle T$ is 5 more than $m\angle R$, and $m\angle S$ is 10 less than $m\angle T$. What is the measure of each angle?

$$m\angle R = 60, m\angle S = 55, m\angle T = 65$$

3. In triangle JKL , $m\angle K$ is four times $m\angle J$, and $m\angle L$ is five times $m\angle J$. What is the measure of each angle?

$$m\angle J = 18, m\angle K = 72, m\angle L = 90$$

4. In triangle XYZ , $m\angle Z$ is 2 more than twice $m\angle X$, and $m\angle Y$ is 7 less than twice $m\angle X$. What is the measure of each angle?

$$m\angle X = 37, m\angle Y = 67, m\angle Z = 76$$

5. In triangle GHI , $m\angle H$ is 20 more than $m\angle G$, and $m\angle G$ is 8 more than $m\angle I$. What is the measure of each angle?

$$m\angle G = 56, m\angle H = 76, m\angle I = 48$$

6. In triangle MNO , $m\angle M$ is equal to $m\angle N$, and $m\angle O$ is 5 more than three times $m\angle N$. What is the measure of each angle?

$$m\angle M = m\angle N = 35, m\angle O = 110$$

7. In triangle STU , $m\angle U$ is half $m\angle T$, and $m\angle S$ is 30 more than $m\angle T$. What is the measure of each angle?

$$m\angle S = 90, m\angle T = 60, m\angle U = 30$$

8. In triangle PQR , $m\angle P$ is equal to $m\angle Q$, and $m\angle R$ is 24 less than $m\angle P$. What is the measure of each angle?

$$m\angle P = m\angle Q = 68, m\angle R = 44$$

9. Write your own problems about measures of triangles.

See students' work.