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?

\[ m\angle D = 27, \quad m\angle E = 81, \quad m\angle F = 72 \]

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?

\[ m\angle R = 60, \quad m\angle S = 55, \quad m\angle T = 65 \]

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?

\[ m\angle J = 18, \quad m\angle K = 72, \quad m\angle L = 90 \]

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?

\[ m\angle X = 37, \quad m\angle Y = 67, \quad m\angle Z = 76 \]

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?

\[ m\angle G = 56, \quad m\angle H = 76, \quad m\angle I = 48 \]

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?

\[ m\angle M = m\angle N = 35, \quad m\angle O = 110 \]

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?

\[ m\angle S = 90, \quad m\angle T = 60, \quad m\angle U = 30 \]

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?

\[ m\angle P = m\angle Q = 68, \quad m\angle R = 44 \]

9. Write your own problems about measures of triangles.

See students’ work.