Geometry 4.2 – Angles of Triangles

Find \( m \angle 1 \).

1. \( m \angle 1 = 25^\circ \)
2. \( m \angle 1 = 73^\circ \)
3. \( m \angle 1 = 60^\circ \)

Find the value of each variable.

4. \( x = 67^\circ \)
   \( y = 113^\circ \)
   \( z = 17^\circ \)

5. \( x = 59^\circ \)
   \( y = 81^\circ \)
   \( z = 99^\circ \)

6. \( x = 33^\circ \)
   \( y = 134^\circ \)
   \( z = 46^\circ \)

Find each missing angle measure.

16. \( m \angle 3 = 22^\circ \)
   \( m \angle 4 = 22^\circ \)
   \( m \angle 5 = 88^\circ \)

17. \( m \angle 1 = 33^\circ \)
   \( m \angle 2 = 52^\circ \)

Find the value of the variables and the measures of the angles.

8. \( (8x + 2)^\circ = 42^\circ \)
   \( (9x + 3)^\circ = 48^\circ \)

9. \( 2x + 6 + 2x - 6 + x = 180 \)
   \( 5x = 180 \)
   \( x = 36 \)

\[ 8x + 2 + 9x + 3 + 90 = 180 \]
\[ 17x + 95 = 180 \]
\[ 17x = 85 \]
\[ x = 5 \]
2. What is the value of $z$?

\[ x = 54 \]
\[ y = 126 \]
\[ z = 35 \]

3. What is the value of $s$?

\[ \frac{1}{7}s + 3 + \frac{1}{7}s - 3 + s = 180 \]
\[ 7 \left( \frac{s}{7} \right) = (180) \]
\[ 9s = 1260 \]
\[ s = 140 \]

5. What is the value of $t$ on the truss of the bridge?

$t = 35^\circ$

**Example 2** Find the missing angle measures.

\[ m\angle 1 = 32^\circ \]
\[ m\angle 2 = 32^\circ \]
\[ m\angle 3 = 40^\circ \]
Find the measure of each angle.

14. \( m \angle 1 = 27^\circ \)
15. \( m \angle 2 = 27^\circ \)

Find the measure of each numbered angle.

3. \( \triangle VUT \)
   
   \( m \angle 1 = 30 \)
   \( m \angle 2 = 60 \)

4. \( \triangle PON \)
   
   \( m \angle 1 = 56^\circ \)
   \( m \angle 2 = 56^\circ \)
   \( m \angle 3 = 74^\circ \)

5. \( \triangle RWS \)
   
   \( m \angle 1 = 30 \)
   \( m \angle 2 = 60 \)

Find the measure of each angle if \( \angle BAD \) and \( \angle BDC \) are right angles and \( m \angle ABC = 84^\circ \).

12. \( m \angle 1 = 26^\circ \)
13. \( m \angle 2 = 32^\circ \)

7. Use the diagram at the right to answer the questions.
   a. Which angle is an exterior angle? \( \angle 1 \)
   b. What are its remote interior angles? \( 38^\circ \) and \( 70^\circ \)
   c. Find \( m \angle 1 \) and \( m \angle 2 \).
      \( m \angle 1 = 108^\circ \)
      \( m \angle 2 = 72^\circ \)

4. What is the value of \( e \)?
   \( e = 69 + 60 \)
   \( e = 129^\circ \)
10. In the figure at the right, $\overline{ED} \perp \overline{CB}$ and $\overline{ED}$ bisects $\angle CDB$. Find $m\angle DBA$.

\[2x + \frac{1}{2}x + 90 = 180\]
\[2\frac{1}{2}x = 90\]
\[2.5x = 90\]
\[x = 36^\circ\]

$m\angle DBA = 108^\circ$

Find the measure of each numbered angle.

1. $\angle X$

$m\angle 1 = 50 + 65 = 115^\circ$

Find the measure of each numbered angle.

3. $\angle N$

$m\angle 1 = 60$
$m\angle 2 = 60$
$m\angle 3 = 120$

Find $x$.

5. $\triangle ABC$

$2x + 95 = 145$
$2x = 50$
$x = 25$

9. $\triangle EFG$

$2x = 58$
$x = 29$
Find the measure of each angle.

6. $\angle 1 = 125^\circ$

7. $\angle 2 = 55^\circ$

8. $\angle 3 = 95^\circ$

Find the measure of each angle.

1. $\angle 1 = 140^\circ$

2. $\angle 2 = 40^\circ$

3. $\angle 3 = 65^\circ$

4. $\angle 4 = 75^\circ$

5. $\angle 5 = 115^\circ$

18. **Reasoning** Two angles of a triangle measure 53 and 39. What is the measure of the largest exterior angle of the triangle? Explain.

Find the measure of each angle.

9. $\angle 1 = 104^\circ$

10. $\angle 4 = 45^\circ$

11. $\angle 3 = 65^\circ$

12. $\angle 2 = 77^\circ$

13. $\angle 5 = 73^\circ$

14. $\angle 6 = 147^\circ$
12. The ratio of the angle measures of the acute angles in a right triangle is $2 : 3$. Find the measures of the acute angles.

\[
\frac{129}{2} = 64.5
\]

\[
\frac{180 - 65}{5} = 51\degree
\]

\[
m\angle 1 = 51\degree
\]
\[
m\angle 2 = 51\degree
\]
\[
m\angle 3 = 51\degree
\]
\[
m\angle 4 = 129\degree
\]
\[
m\angle 5 = 51\degree
\]
\[
m\angle 6 = 64.5\degree
\]
\[
m\angle 7 = 64.5\degree
\]
\[
m\angle 8 = 64.5\degree
\]
\[
m\angle 9 = 51\degree
\]
\[
m\angle 10 = 64.5\degree
\]
\[
m\angle 11 = 115.5\degree
\]
\[
m\angle 12 = 64.5\degree
\]
\[
m\angle 13 = 115.5\degree
\]
\[
m\angle 14 = 64.5\degree
\]
\[
m\angle 15 = 64.5\degree
\]
\[
m\angle 16 = 115.5\degree
\]
\[
m\angle 17 = 64.5\degree
\]
\[
m\angle 18 = 64.5\degree
\]
\[
m\angle 19 = 64.5\degree
\]
\[
m\angle 20 = 115.5\degree
\]
\[
m\angle 21 = 129\degree
\]