



1. In isosceles triangle $\triangle PQR$, \overline{QR} is the base.
 a) Draw a picture and label the congruent sides and congruent angles.

b) If $m\angle Q = 8x - 3$ and $m\angle R = 2x + 15$, solve for x .

$$\begin{aligned} 8x - 3 &= 2x + 15 \\ 6x &= 18 \\ x &= 3 \end{aligned}$$

2. In $\triangle GEO$, $m\angle G = 46^\circ$ and $m\angle E = 87^\circ$. Find $m\angle O$.

$$\begin{aligned} 46 + 87 + x &= 180 \\ x &= 47 \end{aligned}$$

3. In $\triangle XYZ$, $m\angle X = 2x$, $m\angle Y = x + 31$, and $m\angle Z = 3x - 37$.

a) Solve for x .

$$\begin{aligned} 2x + x + 31 + 3x - 37 &= 180 \\ 6x - 6 &= 180 \\ 6x &= 186 \\ x &= 31 \end{aligned}$$

b) Find the measure of each angle.

$$m\angle X = 2(31) = 62$$

$$m\angle Z = 3(31) - 37 = 56$$

$$m\angle Y = 31 + 31 = 62$$

c) Classify the triangle as isosceles, equilateral, or neither.

For Problems 4-8, solve for x .

4.

$$\begin{aligned} 2x + 5 + 3x - 15 + 5x &= 180 \\ 10x - 10 &= 180 \\ 10x &= 190 \\ x &= 19 \end{aligned}$$

5.

$$\begin{aligned} 3x - 30 &= 2x + 30 \\ x &= 60 \end{aligned}$$

6.

$$\begin{aligned} 6x + 8 &= 30 + 4x + 2 \\ 6x + 8 &= 4x + 32 \\ 2x &= 24 \\ x &= 12 \end{aligned}$$

7.

$$\begin{aligned} x + 5 + 3x - 10 &= 115 \\ 4x - 5 &= 115 \\ 4x &= 120 \\ x &= 30 \end{aligned}$$

8.

$$\begin{aligned} x + x + 28 &= 180 \\ 2x + 28 &= 180 \\ 2x &= 152 \\ x &= 76 \end{aligned}$$

9. Find the sum of the interior angles in a figure with the given number of sides:

a) 10 \rightarrow 8 triangles
 $180(8) = 1440$

b) 4 \rightarrow 2 triangles
 $180(2) = 360$

c) 9 \rightarrow 7 triangles
 $180(7) = 1260$

10. The sum of 5 angles in a hexagon is 650° .

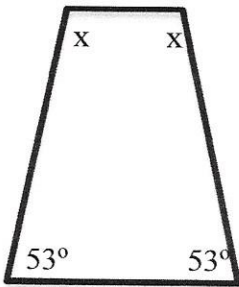
a) What is the sum of all six angles?

6 sides \rightarrow 4 triangles
 $180(4) = 720$

b) What must be the measure of the 6th angle?

$650 + x = 720$
 $x = 70$

11.



a) What is the sum of the 4 angles in the quadrilateral?

\rightarrow 2 triangles

$180(2) = 360$

b) Find x.

$x + x + 53 + 53 = 360$
 $2x + 106 = 360$
 $2x = 254$
 $x = 127$

12. Can the following side lengths form a triangle?

a) 4, 5, 2

$4 + 2 > 5$
 yes

b) 3, 3, 6

$3 + 3 > 6$
 no

c) 20, 16, 5

$16 + 5 > 20$
 yes

d) 11, 36, 22

$11 + 22 > 36$
 no

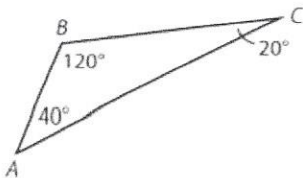
13. Two side length of a triangle are 10 and 13. Fill in the lower and upper bound for the range of values that the third side could be:

3 $< x <$ 23

$13 - 10 = 3$

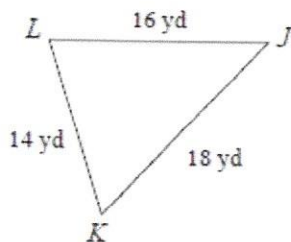
$13 + 10 = 23$

14. Put the sides in order from least to greatest:



$BA < BC < AC$

15. Put the angles in order from least to greatest:



$m\angle J < m\angle K < m\angle L$