

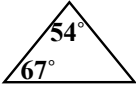
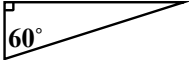

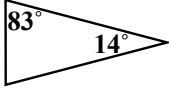
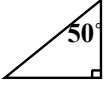
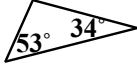


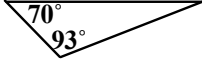
Triangle Sum Theorem

“Triangle Sum Theorem” is a fancy term for a simple but ridiculously important fact:

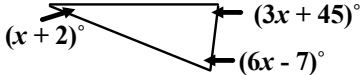
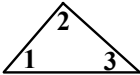
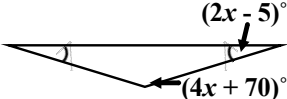
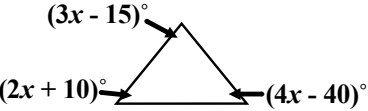
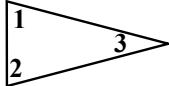
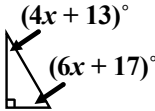
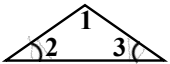
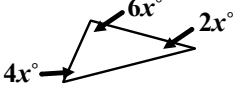
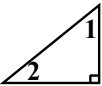
The three angles of a triangle will always ADD TO EQUAL 180°.

Just like a line is always 180°, a triangle always has three angles that add to equal 180°. *You must use all three angles.*

Determine the measure of the unmarked angle.

<p>EXAMPLE I'll call the unknown x.</p>  $54 + 67 + x = 180$ $121 + x = 180$ $x = \boxed{59^\circ}$	<p>EXAMPLE The unknown is x.</p>  $90 + 60 + x = 180$ $150 + x = 180$ $x = \boxed{130^\circ}$	<p>EXAMPLE Since the unknowns are \cong, they're both x.</p>  $98 + x + x = 180$ $98 + 2x = 180$ $2x = 82$ $x = \boxed{41^\circ}$
<p>1.</p> 	<p>2.</p> 	<p>3.</p> 
<p>4.</p> 	<p>5.</p> 	<p>6.</p> 

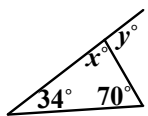
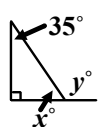
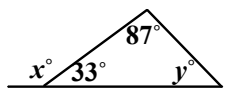
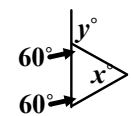
Determine the measure of all the angles.

<p>EXAMPLE</p>  $(x + 2) + (3x + 45) + (6x - 7) = 180$ $10x + 40 = 180$ $10x = 140$ $x = 14$ $x + 2 = 14 + 2 = \boxed{16^\circ}$ $3x + 45 = 3(14) + 45 = 42 + 45 = \boxed{87^\circ}$ $6x - 7 = 6(14) - 7 = 84 - 7 = \boxed{77^\circ}$	<p>EXAMPLE</p>  $m\angle 1 = (3x - 1)^\circ,$ $m\angle 2 = (3x + 22)^\circ,$ $\& m\angle 3 = (x + 12)^\circ$ $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$ $(3x - 1) + (3x + 22) + (x + 12) = 180$ $7x + 33 = 180$ $7x = 147$ $x = 21$ $m\angle 1 = 3(21) - 1 = 63 - 1 = \boxed{62^\circ}$ $m\angle 2 = 3(21) + 22 = 63 + 22 = \boxed{85^\circ}$ $m\angle 3 = 21 + 12 = \boxed{33^\circ}$	<p>EXAMPLE</p>  $(4x + 70) + (2x - 5) + (2x - 5) = 180$ $8x + 60 = 180$ $8x = 120$ $x = 15$ $2x - 5 = 2(15) - 5 = 30 - 5 = \boxed{25^\circ}$ $4x + 70 = 4(15) + 70 = 60 + 70 = \boxed{130^\circ}$
<p>7.</p> 	<p>8. $m\angle 1 = 5x^\circ, m\angle 2 = 4x^\circ,$ $\& m\angle 3 = (2x - 7)^\circ$</p> 	<p>9.</p> 
<p>10. $m\angle 1 = (10x + 34)^\circ$ $\& m\angle 2 = (5x + 3)^\circ$</p> 	<p>11.</p> 	<p>12. $m\angle 1 = (4x + 8)^\circ$ $\& m\angle 2 = (3x + 5)^\circ$</p> 

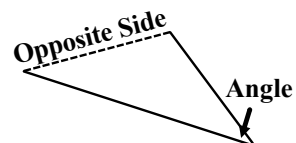
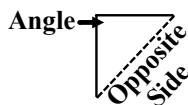
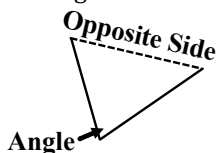
Triangle Facts

Fact 1: The angles of a triangle add to equal 180° , just like a linear pair adds to equal 180° .

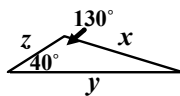
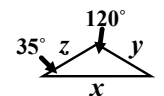
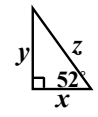
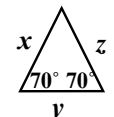
Determine the measure of x and y .

<p>EXAMPLE</p>  <p>Interior Angle: $x + 34 + 70 = 180$ $x + 104 = 180$ $x = \boxed{76^\circ}$</p> <p>Exterior Angle: $x + y = 180$ $76 + y = 180$ $y = \boxed{104^\circ}$</p>	<p>13.</p> 	<p>14.</p> 	<p>15.</p> 
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Fact 2: Each angle on a triangle *creates* its opposite side. The bigger the angle is, the bigger its opposite side is.

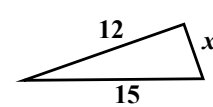
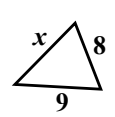
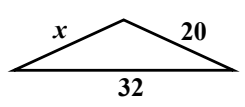
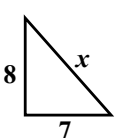


Arrange the variables in order from smallest to biggest.

<p>EXAMPLE</p>  <p>40° -opposite $\rightarrow x$ 130° -opposite $\rightarrow y$ $?^\circ$ -opposite $\rightarrow z$ $40 + 130 + ? = 180$ $170 + ? = 180$ $? = 10^\circ$ 10° -opposite $\rightarrow z$</p> <p><i>Smallest to Biggest:</i> $10^\circ, 40^\circ, 130^\circ$, so... $\boxed{z, x, y}$</p>	<p>16.</p> 	<p>17.</p> 	<p>18.</p> 
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Fact 3: The third side of a triangle cannot be longer than the other two added up or shorter than the difference between the other two (subtraction).

Determine the range of lengths for the third side.

<p>EXAMPLE</p>  <p>$15 - 12 < x < 15 + 12$ $\boxed{3 < x < 27}$</p>	<p>19.</p> 	<p>20.</p> 	<p>21.</p> 
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