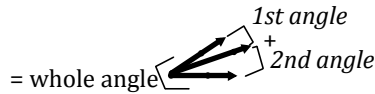


Measuring Angles Using Angle Addition

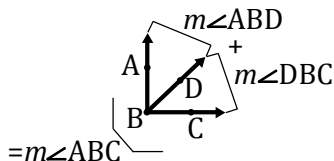
Angles follow the same addition rules as segments. Two attached angles add to equal the larger angle.



Example	Your Turn	Still Your Turn
<div style="text-align: center;"> </div> <p><math>m\angle ABD = ?</math>      <i>First, use the drawing to write the angle equation.</i></p> <div style="text-align: center;"> </div> <p><math>m\angle ABD + m\angle DBC = m\angle ABC</math></p> <p><i>Now, plug in what you know and solve.</i>  <math>m\angle ABD = 6x^\circ, m\angle DBC = 40^\circ,</math>  <math>m\angle ABC = 8x^\circ</math></p> $6x + 40 = 8x$ $40 = 2x$ $20 = x$ <p><i>Plug it into <math>m\angle ABD</math>.</i>  <math>m\angle ABD = 6x = 6(20) = 120^\circ</math>      <b>(OBTUSE)</b></p>	<p>1.</p> <div style="text-align: center;"> </div> <p><math>m\angle PQR = ?</math></p> <p style="text-align: center;"><b>Is this angle acute, right, obtuse, or straight?</b></p>	<p>2.</p> <div style="text-align: center;"> </div> <p><math>m\angle FEG = ?</math></p> <p style="text-align: center;"><b>Is this angle acute, right, obtuse, or straight?</b></p>
<div style="text-align: center;"> </div> <p><math>m\angle PQS = (4x + 10)^\circ</math>  <math>m\angle PQR = (10x + 2)^\circ</math>  <math>m\angle SQR = (3x + 7)^\circ</math>  <math>m\angle SQR = ?</math></p> <p><i>First, use the drawing to write the angle equation.</i></p> <div style="text-align: center;"> </div> <p><math>m\angle PQS + m\angle SQR = m\angle PQR</math></p> <p><i>Now, plug in what you know and solve.</i>  <math>m\angle PQS = (4x + 10)^\circ</math>  <math>m\angle SQR = (3x + 7)^\circ</math>  <math>m\angle PQR = (10x + 2)^\circ</math></p> $4x + 10 + 3x + 7 = 10x + 2$ $7x + 17 = 10x + 2$ $17 = 3x + 2$ $15 = 3x$ $5 = x$ <p><i>Plug <math>x = 5</math> into <math>m\angle SQR</math>.</i>  <math>m\angle SQR = 3x + 7 = 3(5) + 7 = 15 + 7</math>  <math>m\angle SQR = 22^\circ</math>      <b>(ACUTE)</b></p>	<p>3.</p> <div style="text-align: center;"> </div> <p><math>m\angle GHJ = (20x - 10)^\circ</math>  <math>m\angle GHI = (23x - 7)^\circ</math>  <math>m\angle JHI = (4x - 1)^\circ</math>  <math>m\angle JHI = ?</math></p> <p style="text-align: center;"><b>Is this angle acute, right, obtuse, or straight?</b></p>	<p>4.</p> <div style="text-align: center;"> </div> <p><math>m\angle LMN = (12x + 20)^\circ</math>  <math>m\angle LMP = (5x + 14)^\circ</math>  <math>m\angle PMN = (8x - 2)^\circ</math>  <math>m\angle LMP = ?</math></p> <p style="text-align: center;"><b>Is this angle acute, right, obtuse, or straight?</b></p>

$\overrightarrow{BD}$  goes through  $\angle ABC$ .  $m\angle ABC = 70^\circ$ ,  
 $m\angle ABD = 2x^\circ$ , and  $m\angle DBC = 3x^\circ$ .  
 $m\angle ABD = ?$

**DRAW IT!!**



The angle does not have to be the right size,  
as long as ray  $BD$  goes through it!

$$m\angle ABD + m\angle DBC = m\angle ABC$$

Now, plug in what you know and solve.

$$m\angle ABD = 2x^\circ \quad m\angle DBC = 3x^\circ$$

$$m\angle ABC = 70^\circ$$

$$2x + 3x = 70$$

$$5x = 70$$

$$x = 14$$

Plug it into  $\angle ABD$ .

$$m\angle ABD = 2x = 2(14)$$

$$m\angle ABD = 28^\circ$$

**(ACUTE)**

5.  $\overrightarrow{HK}$  goes through  $\angle GHJ$ .  
 $m\angle GHK = 30^\circ$ ,  $m\angle GHJ = 18x^\circ$ ,  
and  $m\angle KHJ = 3x^\circ$ .  $m\angle GHJ = ?$

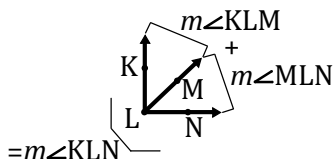
6.  $\overrightarrow{MN}$  goes through  $\angle LMP$ .  
 $m\angle LMP = 6x^\circ$ ,  $m\angle LMN = 30^\circ$   
, and  $m\angle NMP = 3x^\circ$ .  
 $m\angle LMP = ?$

**Is this angle acute, right, obtuse,  
or straight?**

**Is this angle acute, right, obtuse,  
or straight?**

$M$  is in the interior of  $\angle KLN$ .  
 $m\angle KLN = 3x^\circ$ ,  $m\angle KLM = (x + 40)^\circ$ , and  
 $m\angle MLN = (x + 10)^\circ$ .  $m\angle KLN = ?$

**DRAW IT!!**



The angle does not have to be the right size,  
as long as point  $M$  is inside it!

$$m\angle KLM + m\angle MLN = m\angle KLN$$

Now, plug in what you know & solve.

$$m\angle KLM = (x + 40)^\circ \quad m\angle MLN = (x + 10)^\circ$$

$$m\angle KLN = 3x^\circ$$

$$(x + 40) + (x + 10) = 3x$$

$$2x + 50 = 3x$$

$$50 = x$$

Plug it into  $\angle KLN$ .

$$m\angle KLN = 3x = 3(50)$$

$$m\angle KLN = 150^\circ$$

**(OBTUSE)**

7.  $A$  is in the interior of  $\angle BCD$ .  
 $m\angle BCD = (9x - 13)^\circ$ ,  
 $m\angle BCA = (2x + 7)^\circ$ , and  
 $m\angle ACD = 5x^\circ$ .  $m\angle BCA = ?$

8.  $R$  is in the interior of  $\angle PQS$ .  
 $m\angle PQR = (3x + 4)^\circ$ ,  
 $m\angle PQS = (8x - 41)^\circ$ , and  
 $m\angle RQS = (2x)^\circ$ .  $m\angle PQS = ?$

**Is this angle acute, right, obtuse,  
or straight?**

**Is this angle acute, right, obtuse,  
or straight?**

