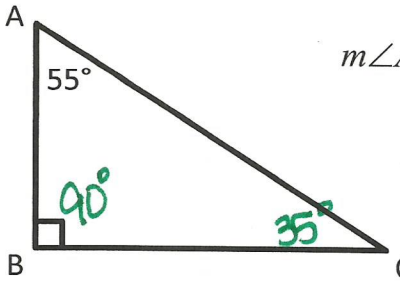
Lesson 19 Notes: Angle/Triangle Relationships

SUM OF THE ANGLES IN A TRIANGLE.

- the angles in a triangle ALWAYS add up to 180°.

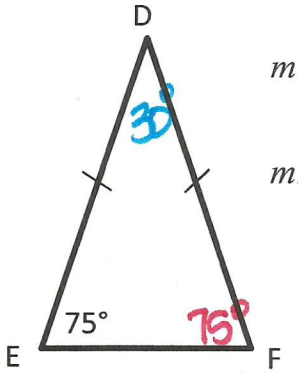
Find the missing angle measures.



$m\angle ACB =$ 35°

55 + 90 = 145

180 − 145 = 35



$m\angle EFD =$ 75°

$m\angle EDF =$ 30°

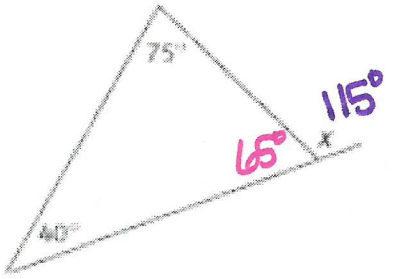
75 + 75 = 150

180 − 150 = 30

EXTERIOR ANGLES OF A TRIANGLE.

- when the side lengths of a triangle are extended, it creates exterior angles.
- The exterior angle and the angle that is adjacent to it are Supplementary, which means that they add up to 180°.

Find the value of x.

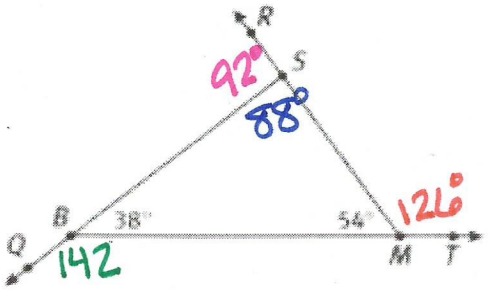


40 + 75 = 115

180 − 115 = 65

180 − 65 = 115

Find each of the missing angles.



$m\angle QBM =$ 142°

$m\angle RMT =$ 126°

$m\angle MSB =$ 88°

$m\angle RSB =$ 92°

180 − 38 = 142

180 − 54 = 126

38 + 54 = 92

180 − 92 = 88

180 − 88 = 92

Segment AC was drawn to create triangle ABC.

$m\angle ACB =$ 58°

32 + 90 = 122
180 - 122 = 58

Draw segment CD.

$m\angle CAD =$ 58°

90 - 32 = 58

$m\angle ACD = 43°$

$m\angle ADC =$ 79°

58 + 43 = 101
180 - 101 = 79

Draw segment CF

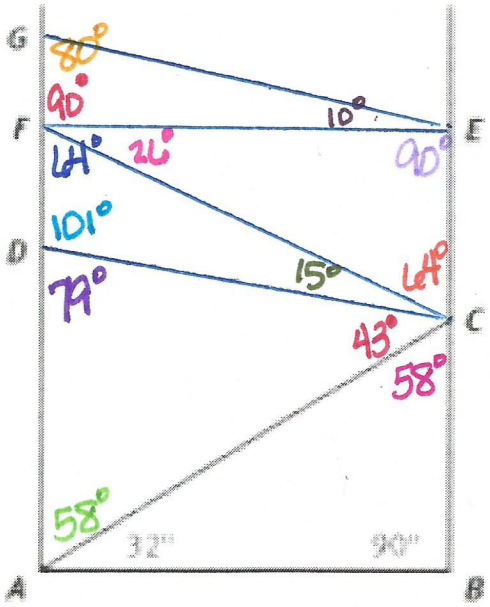
$m\angle FDC =$ 101°

180 - 79 = 101

$m\angle FCD = 15°$

$m\angle DFC =$ 64

101 + 15 = 116
180 - 116 = 64



Draw segment FE

$m\angle FCE =$ 64°

15 + 43 + 58 = 116
180 - 116 = 64

$m\angle FEC =$ 90°

90 + 64 = 154

$m\angle EFC =$ 26°

180 - 154 = 26

Draw segment EG

$m\angle GFE =$ 90

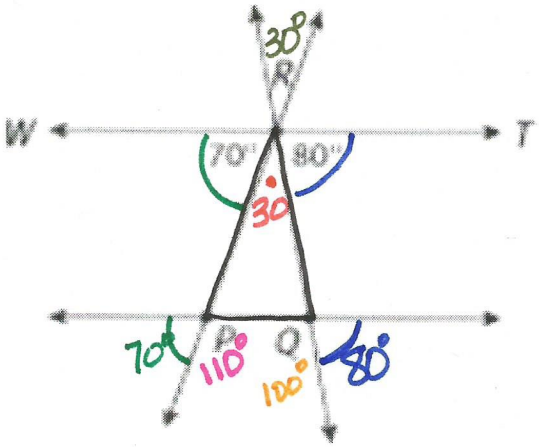
64 + 26 = 90
180 - 90 = 90

$m\angle GEF = 10°$

$m\angle EGF =$ 80°

90 + 10 = 100
180 - 100 = 80

Use your knowledge of lines, angles, and triangles to find the measure of angle P, Q, R.



180 - 150 = 30
70 + 80 = 150

$m\angle R =$ 30°

$m\angle P =$ 110°

180 - 70 =

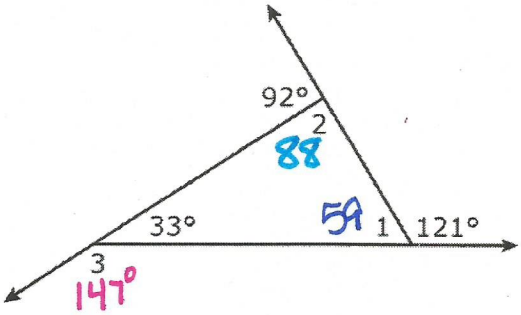
$m\angle Q =$ 100°

180 - 80 = 100°

Guided Practice:

Use the diagram to find each angle measure.

1. angle 1 = 59° $180-121=59$
2. angle 2 = 88° $180-92=88$
3. angle 3 = 147° $180-33=147$



Use the diagram to find each missing measure.

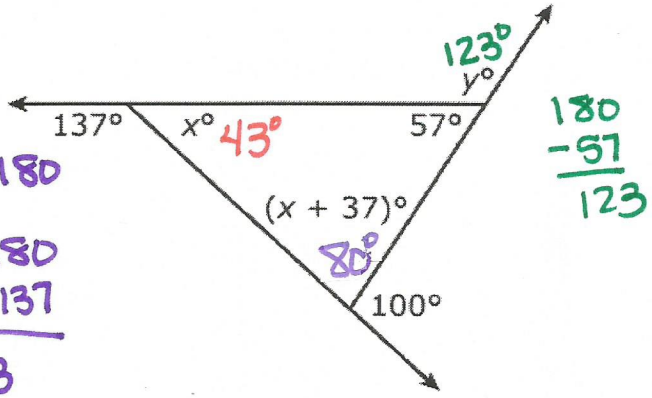
4. angle x = 43° $180-137=43$
5. angle y = 123°
6. angle (x+37) = 80°

$43+57+x+37=180$

$x+137=180$
$-137\quad -137$

$x=43$

$x+37$
$43+37=80°$



$180-57=123$

7. Lines c and d are parallel. The measure of angle 2 is 40° and the measure of angle 3 is 30°. What is the measure of angle 1?

$\angle 1+\angle 2+\angle 3=180$
$\angle 1+40+30=180$

$\angle 1+70=180$
$-70\quad -70$

$\angle 1=110°$