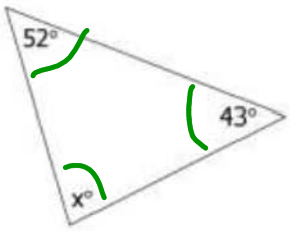
Geometry CC – Unit 1
Lesson 5: Angles in a Triangle

Name: _____
Date: _____

Do Now:

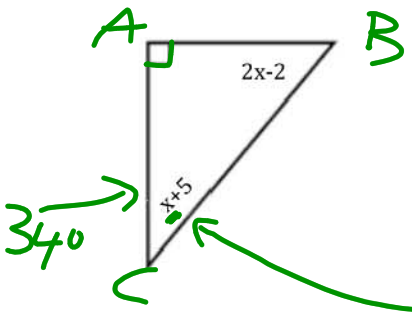
In each diagram, determine the value of x.

1.



$52 + 43 + x = 180$
$95 + x = 180$
$x = 85$

2.



$x + 5 + 2x - 2 + 90 = 180$
$3x + 93 = 180$
$3x = 87$
$x = 29$

Now that we have practiced with finding angle measures within a triangle, let's talk about how we classify triangles. There are different ways that we can classify triangles based off of their angle measures.

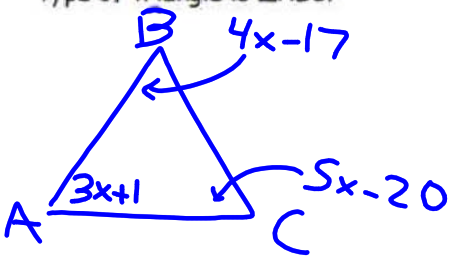
acute, obtuse, right, scalene, isosceles, equilateral

- all ∠'s less than 90°
- one ∠ greater than 90°
- one right angle (90°)
- all ∠'s are diff.
- 2 equal ∠'s
- all ∠'s are equal (60°)

Time to practice!

1.

In ΔABC, $m\angle A = 3x+1$, $m\angle B = 4x-17$ and $m\angle C = 5x-20$. Which type of triangle is ΔABC?



$4x-17+3x+1+5x-20=180$

$\vdots$

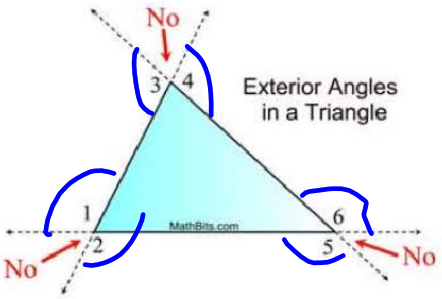
$x = 18$

2.

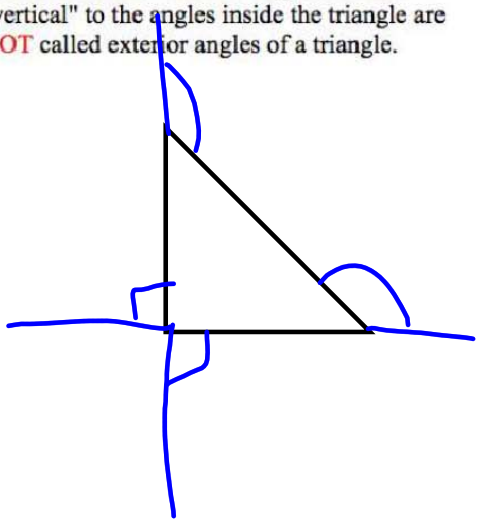
In right triangle ABC, $m\angle C = 3y - 10$, $m\angle B = y + 40$, and $m\angle A = 90$. What type of right triangle is triangle ABC?

1) scalene
2) isosceles
3) equilateral
4) obtuse

Definition: An exterior angle of a triangle is an angle formed by one side of the triangle and the extension of an adjacent side of the triangle.

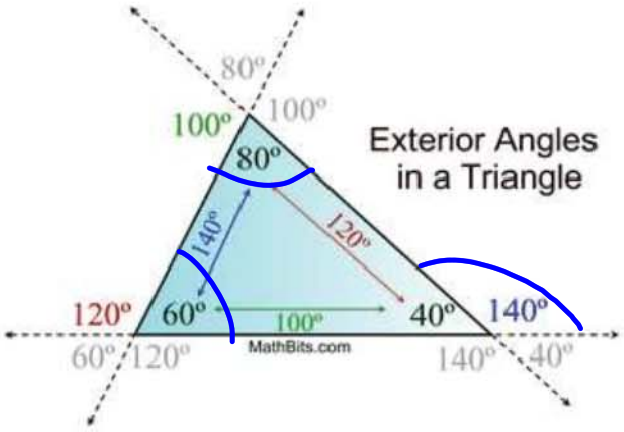


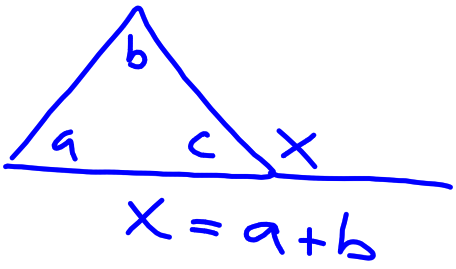
FACTS:
- Every triangle has 6 exterior angles, two at each vertex.
- Angles 1 through 6 are exterior angles.
- Notice that the "outside" angles that are "vertical" to the angles inside the triangle are NOT called exterior angles of a triangle.



Now it's time for the…

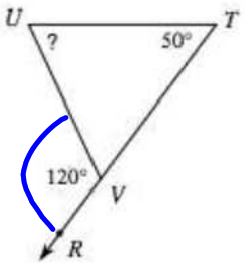
THEOREM: The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles.
(Non-adjacent interior angles may also be referred to as remote interior angles.)





$x = a + b$

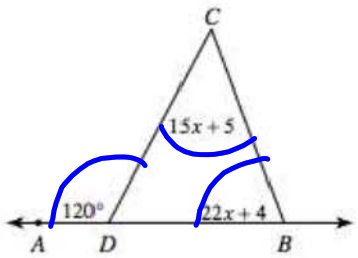
Practice: What is the missing angle?



$120 = ? + 50$

$? = 70°$

What is the measure of Angle CBD?



$120 = 15x + 5 + 22x + 4$