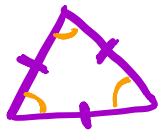
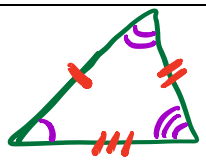
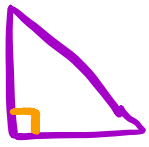
Name_____ Date_____

Unit 8: Angle & Triangle Relationships Math 8R

8-1 Triangles: Angles and Sides!

Learning Target: *I can identify possible side combinations and angle measurements of triangles.*

There are many different types of triangles that you may have already learned about.

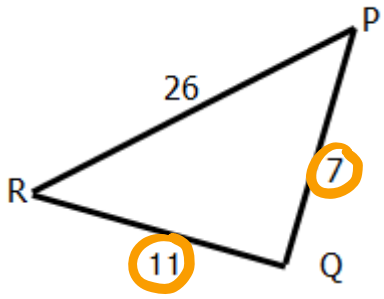
Warm Up:	**Types of Triangles**	
Name of Triangle	**Definition**	**Picture**
Equilateral Triangle	all 3 equal sides, all 3 equal angles.	
Isosceles Triangle	two equal sides, two equal angles	
Scalene Triangle	No equal sides, No equal angles	
Right Triangle	It has a right angle (90°)	

Guided Practice: Triangle Inequality Theorem

The ___Sum___ of the two smaller sides of the triangle must be ___greater___ than the largest third side!

Exercise 1- Given the diagrams below; determine whether a triangle can be created. Show your work to justify your answer.

(a)

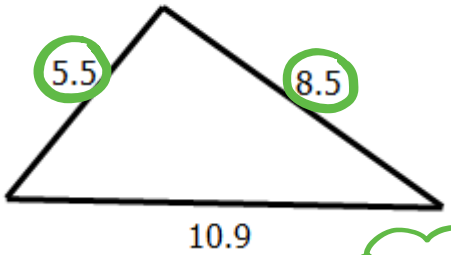


$11+7 > 26$

18×26

NO

(b)



$5.5 + 8.5$

Yes!

$14 > 10.9$

True

Exercise 2- Which of the following numbers **could** represent the side lengths of a triangle?

A) 1cm, 2cm, 3.5cm (1+2=3)

B) 6cm, 8cm, 15cm (14)

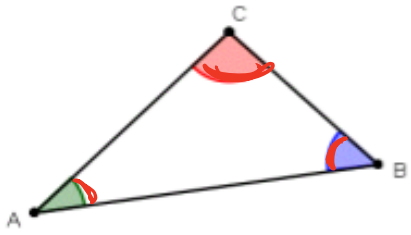
C) 5cm, 8cm, 15cm (13)

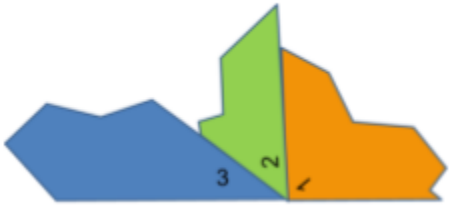
D) 5cm, 7cm, 9cm (12 > 9)

Discovery: Triangle Angle Sum Activity on the Smart Board

Angles in a Triangle

The interior angles in a triangle add up to 180 degrees.

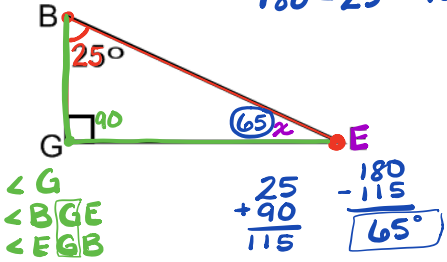




Guided Practice: Triangle Interior Angle Sum Theorems

Exercise 1- Show all your work, for the following problems.

(a) Given the measure of $m < EBG = 25$, determine the $m < BEG$..



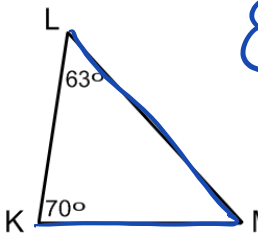
180 − 25 − 90 = 65°

∠G
∠BGE
∠EGB

25 + 90 = 115

180 − 115 = 65°

(b) What is the $m < LMK$?



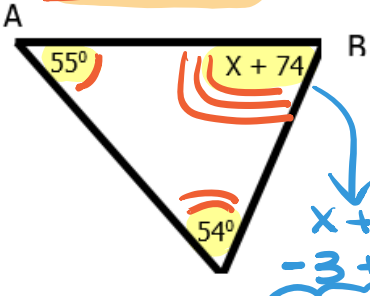
63 + 70 = 133

∠M = 47°

180 − 133 = 47°

180 − 63 − 70 = 47°

Exercise 3- Find the value of x in the triangle below. Then find the measure of angle R



55 + 54 + x + 74 = 180

x + 183 = 180

−183 −183

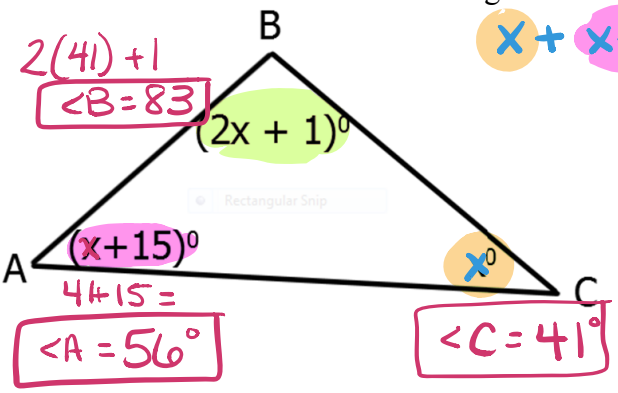
x = −3

x + 74

−3 + 74

∠R = 71°

Exercise 4- Find the measure of each angle in triangle ABC. Show all work.



$x + x+15 + 2x+1 = 180$

$4x + 16 = 180$

$x = 41°$

$2(41)+1$

$\angle B = 83$

$41+15 =$

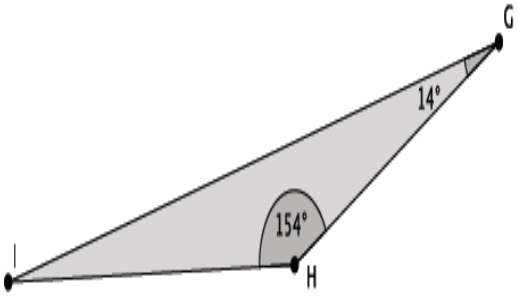
$\angle A = 56°$

$\angle C = 41°$

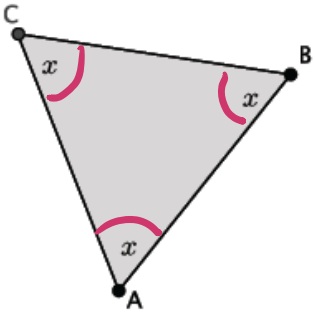
Exercise 5- The measures, in degrees, of the three angles of a triangle are x, x+10, and 2x−6. Find the measure of each angle.

Problem Set:

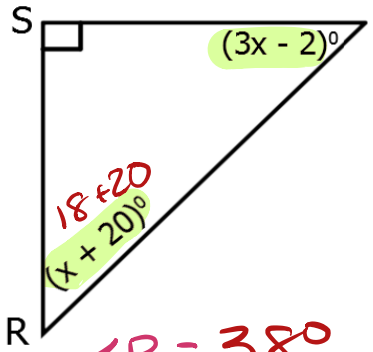
1. Find the measure of $< HIG$



2. What is the measure of $\angle ABC$?



3. Given ΔTSR is a right triangle, with $\angle T = 3x - 2, \angle R = x + 20$. Determine the $m\angle R$ and $m\angle T$.



$90 + 3x - 2 + x + 20 = 180$

$4x + 108 = 180$

$-108 \quad -108$

$\frac{4x}{4} = \frac{72}{4}$

$x = 18$

$\angle R = 38°$

$\angle T =$

4. Which set of side lengths can form a triangle? Show work to support answer.

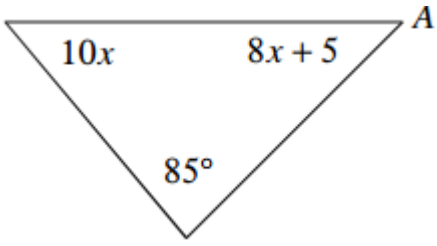
(a) $2cm, 5cm, 9cm$

(b) $5cm, 12cm, 20cm$

(c) $6cm, 7cm, 10cm$

(d) $5cm, 12cm, 17cm$

5. Using the diagram below, find the measure of angle A.



Triangle Basics – Lesson Summary:

1. What is the sum of all the interior angles of a triangle? 180°

2. What is the formula we developed for the sum of interior angles of a triangle?

add up to 180

3. Is there a rule for the side lengths of a triangle?

sum of smaller 2 must be greater than the largest.

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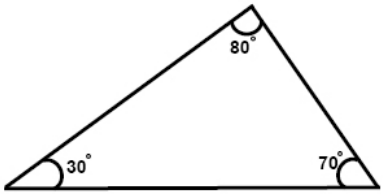
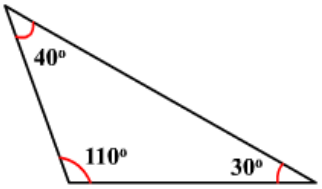
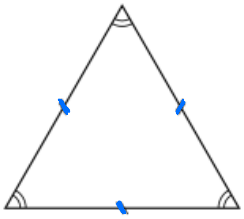
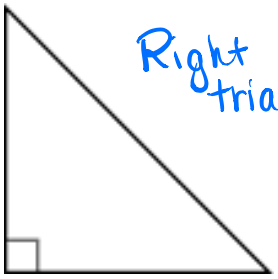
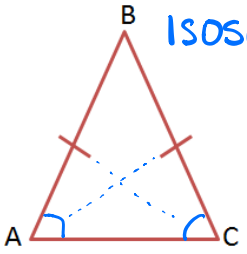
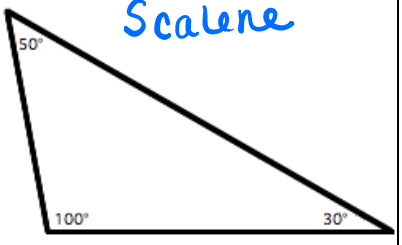
8-2 Interior Angle Sum Theorem

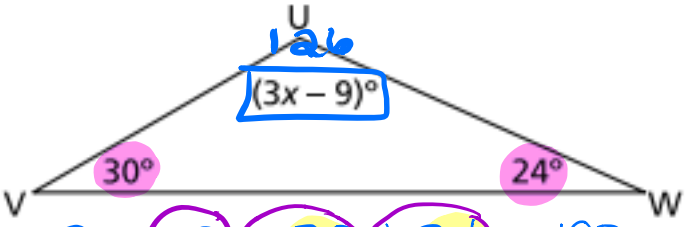
DO NOW: Classify each triangle below using the vocabulary from page 1 of this packet.

1.  Scalene	2.  Scalene	3.  equilateral
4.  Right triangle	5.  Isosceles	6.  Scalene

Let's Practice:

(1) The measures of the angles in triangle UVW are shown in the diagram below.

a) What is the value of x? $x = 45$



$3x - 9 + 30 + 24 = 180$

$3x + 45 = 180$

$-45 \quad -45$

$\frac{3x}{3} = \frac{135}{3}$

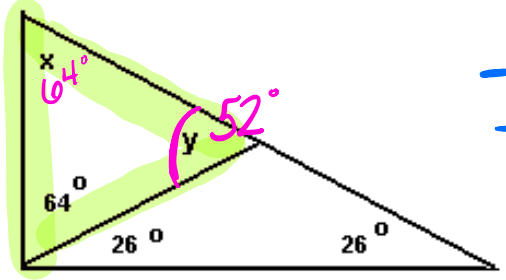
$x = 45$

b) Find $m\angle U$. $126°$

$3x - 9$

$3(45) - 9 = 126$

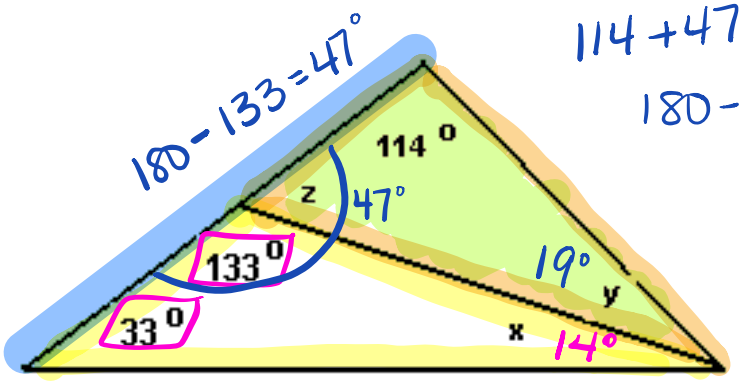
(2) Solve for all missing angles in the diagram below.



$180 - 116 = 64$

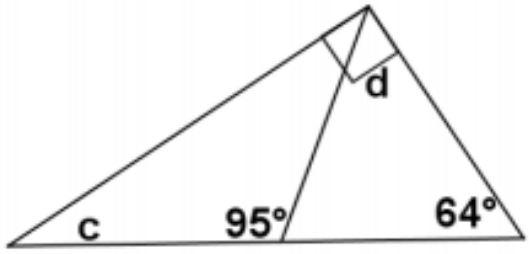
$180 - 64 - 64 = 52°$

(3) Solve for all missing angles in the diagram below.



$+\begin{array}{r}133\\33\\\hline 166\end{array}$ $\begin{array}{r}180\\-166\\\hline 14\end{array}$

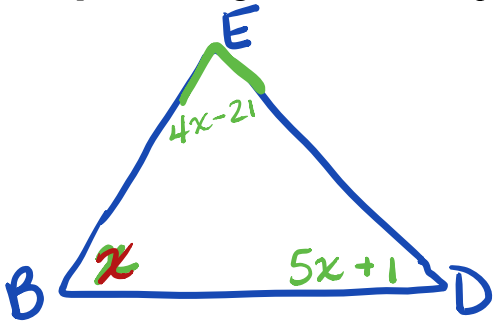
(4) Find all missing angles in the diagram below.



(5) In ΔBED, the measure of $< E$ is 21 ***less than*** *four times the m* $< \boldsymbol{B}$, and the measure of $< D$ is 1 ***more than*** *five times the measure of* $< \boldsymbol{B}$. Find the measure, in degrees, of each angle of ΔBED.

LAST

[Draw a diagram and label all parts!]



$x + 4x - 21 + 5x + 1 = 180$

$10x - 20 = 180$

$+20 \quad +20$

$10x = 200$

$\frac{10x}{10} = \frac{200}{10}$

$x = 20$

$\angle B = x = 20°$

$\angle E = 4x - 21 = 4(20) - 21 = 59°$

$\angle D = 5x + 1 = 5(20) + 1 = 101°$