Triangles: Interior and Exterior Angles: *Follow-up Worksheet (High School)*

NAME(S):_____ **CLASS:**_____ **DATE:**_____

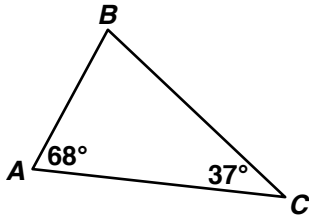
Applying Theorems

Review the following theorems. Then complete Problems 1 – 8.

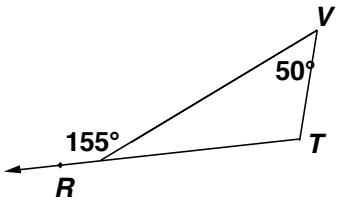
Triangle Sum Theorem:	The sum of the measures of the angles of a triangle is 180.
Exterior Angle Theorem:	The measure of each exterior angle of a triangle equals the sum of the measures of its two remote interior angles.

► Determine the value of the unknown(s).

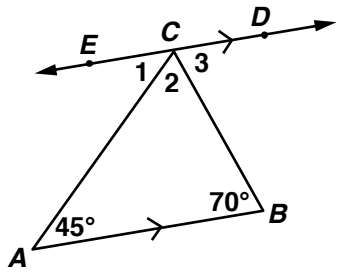
1) $m\angle B =$



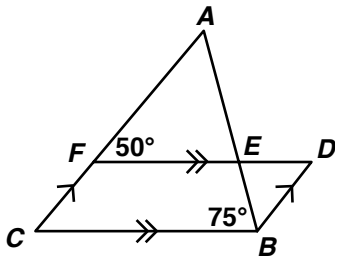
2) $m\angle T =$



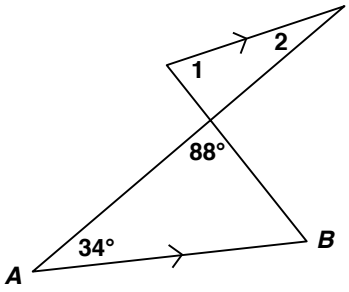
3) $m\angle 1 =$
$m\angle 2 =$
$m\angle 3 =$



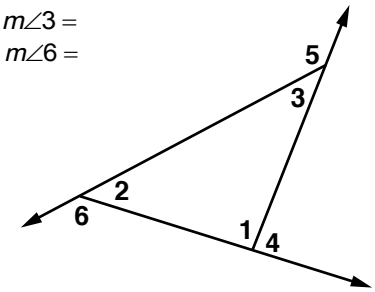
4) $m\angle A =$
$m\angle C =$
$m\angle D =$



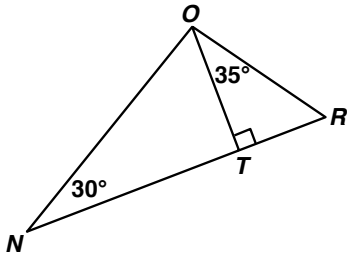
5) $m\angle 1 =$
$m\angle 2 =$



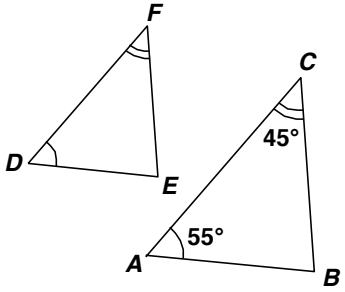
6) $m\angle 1 + m\angle 2 + m\angle 3 =$
$m\angle 4 + m\angle 5 + m\angle 6 =$



7) $m\angle R =$
$m\angle NOT =$
$m\angle NOR =$



8) $m\angle E =$



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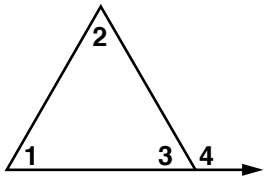
► In Problems 9 – 11, the measurements of two angles of a triangle (ABC) are given. Find the unknown angle. If it is not possible to construct a triangle with the given measurements, write "not possible."

	$m\angle A$	$m\angle B$	$m\angle C$
9)	90	24	
10)	120	95	
11)		60	60

► Use the figure to the right to help you find the unknown angles in Problems 12 – 14. If it is not possible to construct the figure using the given measurements, write "not possible."

	$m\angle 1$	$m\angle 2$	$m\angle 3$	$m\angle 4$
12)	55			75
13)		94		63
14)		25	90	



► Find the measures of the unknown angles described in Problems 15 – 20. When appropriate, give answers to the nearest tenth.

15) If all three angles of a triangle are congruent, what is the measure of each angle? _____

16) If two angles of a right triangle are congruent, what are their measures? _____

17) A right triangle has one acute angle measuring 37. What does the other acute angle measure? _____

18) In a right triangle, if the measures of the other two angles are $2x - 4$ and $3x + 10$, what are the measures of these two angles?

19) A triangle has angles with measures $2x + 5$, $2x - 10$, and $x + 15$. Find the measure of each angle.

20) One angle of a triangle is three times as large as the second angle. The exterior angle at the third vertex is 100. Find the measures of all three interior angles.

Challenge Problem

21) The Triangle Sum Theorem and the Exterior Angle Theorem, along with other basic concepts of plane geometry, change on the surface of a sphere. For example, use the figure to the right and try to sketch a triangle with three right angles. Explain how these two theorems change in a 3-dimensional or non-Euclidean world.