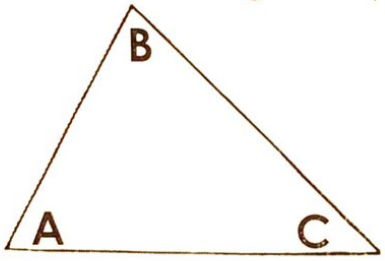
Name: Key Date:

Triangles – Inequalities

Triangle Proof!!!

Angle Sum Theorem

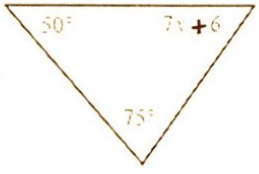
The sum of the angles is any triangle is 180°.



$\angle A + \angle B + \angle C = 180$

Solve for x.

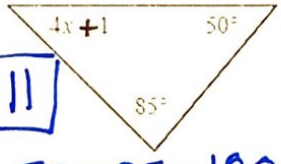
1. $x = 7$



$50 + 7x + 6 + 75 = 180$

$136 + 7x = 180$

2. $x = 11$

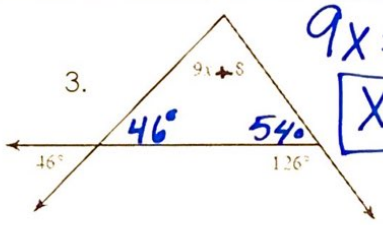


$4x + 1 + 50 + 85 = 180$

$4x + 136 = 180$

$4x = 44$

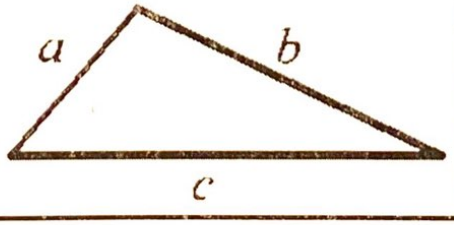
3. $9x = 72$, $x = 8$



$9x + 8 + 46 + 54 = 180$

$9x + 108 = 180$

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.



$a + b > c$

$b + c > a$

$c + a > b$

Are these possible side lengths of a triangle?

4. 10, 10, 6 (c b a)

$6 + 10 \square 10$

$16 > 10$ yes!

5. 1, 7, 8 (a b c)

$1 + 7 \square 8$

$8 = 8$ NO!

6. 6, 18, 9 (a c b)

$6 + 9 \square 18$

$15 < 18$ No!

What is the range of possible side lengths for the third side?

7. 10, 11 (a b)

$1 < x < 21$

8. 6, 8

$8 - 6 = 2$

$8 + 6 = 14$

$2 < x < 14$

9. 12, 7

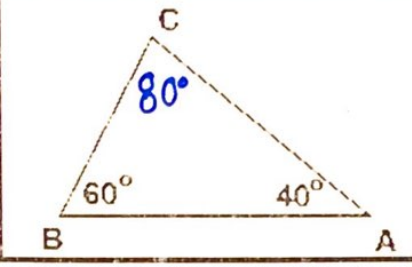
$12 - 7 = 5$

$12 + 7 = 19$

$5 < x < 19$

The shortest side of a triangle is opposite the smallest angle.

The longest side of a triangle is opposite the largest angle.

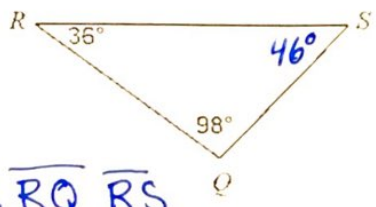


List the sides from shortest to longest!

$\overline{BC}, \overline{CA}, \overline{BA}$

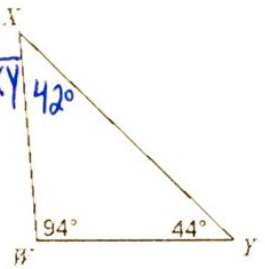
List the sides in order from least to greatest:

7.



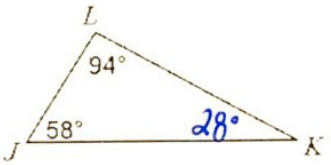
$\overline{OS}, \overline{RQ}, \overline{RS}$

8.



$\overline{WY}, \overline{XW}, \overline{XY}$

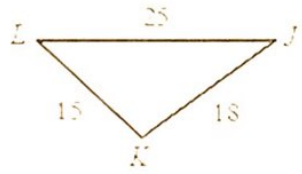
9.



$\overline{JL}, \overline{LK}, \overline{JK}$

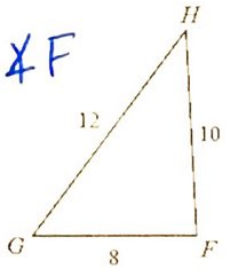
List the angles in order from least to greatest:

10.



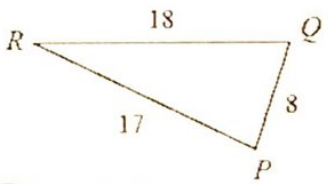
$\angle J, \angle L, \angle K$

11.

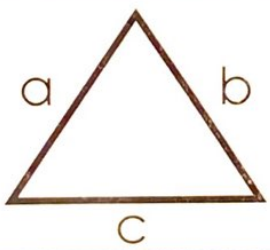
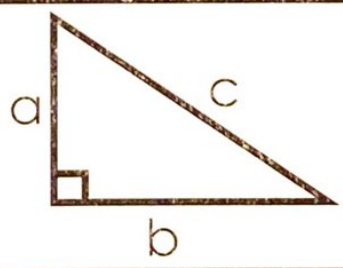
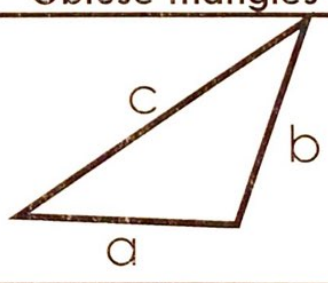


$\angle H, \angle G, \angle F$

12.



$\angle R, \angle Q, \angle P$

Acute Triangles	Right Triangles	Obtuse Triangles
		
$c^2 < a^2 + b^2$	$c^2 = a^2 + b^2$	$c^2 > a^2 + b^2$

Classify each triangle as acute, right or obtuse.

13. 5ft, 12ft, 13ft

a b c

$13^2 \square 5^2 + 12^2$

$169 \boxed{=} 169$

right

14. 9km, 12km, 16km

$16^2 \square 9^2 + 12^2$

$256 \boxed{>} 225$

Obtuse

a b c

15. 8ft, 8ft, 10ft

$10^2 \square 8^2 + 8^2$

$100 \boxed{<} 64 + 64$

acute