69.   **Which sequence of transformations maps △ABC to △RST?**
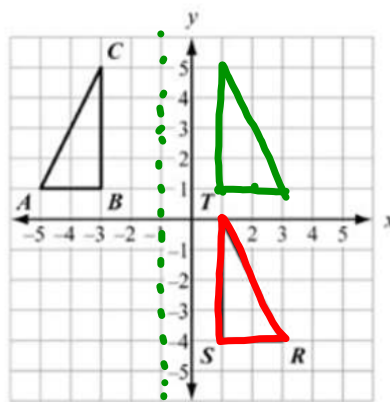
A.   Reflect △ABC across the line $x = -1$. Then translate the result 1 unit down.

B.   Reflect △ABC across the line $x = -1$. Then translate the result 5 units down.

C.   Translate △ABC 6 units to the right. Then rotate the result 90° clockwise about the point (1, 1).

D.   Translate △ABC 6 units to the right. Then rotate the result 90° counterclockwise about the point (1, 1).
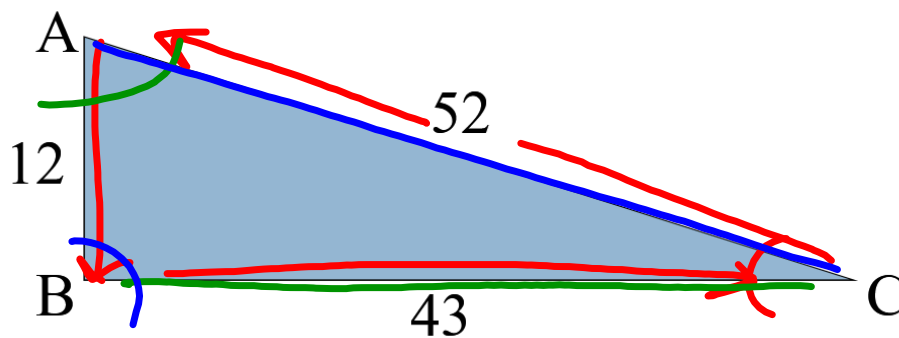
Side – Angle Inequalities

- If one side of a triangle is longer than another side, then the angle opposite the longer side is larger than the angle opposite the smaller side.

Ex. 1 Write the measurements of the angles in order from least to greatest.

A

12

52

B

43

C

Step 1. Write the sides in order from least to greatest.

AB , BC , CA

Step 2. Write the angles opposite those sides.   ∠C, ∠A, ∠B

If one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.
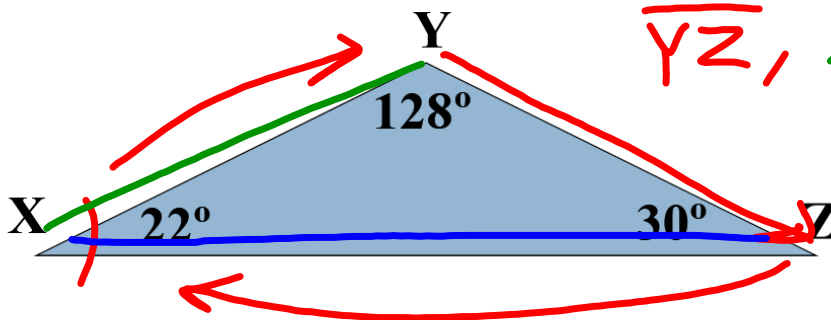
Ex. 2 Write the measurements of the sides in order from least to greatest.

Step 1. List the angles in order from least to greatest.
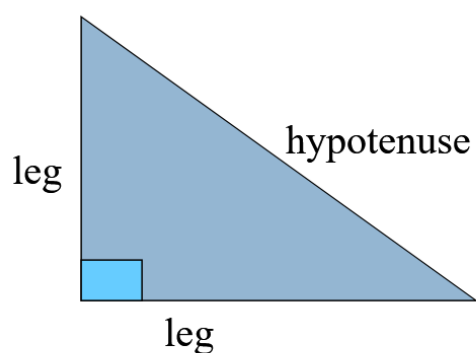
$\angle X, \angle Z, \angle Y$

Step 2. Write the sides opposite those angles.

$\overline{YZ}, \overline{XY}, \overline{ZX}$

Y

128°

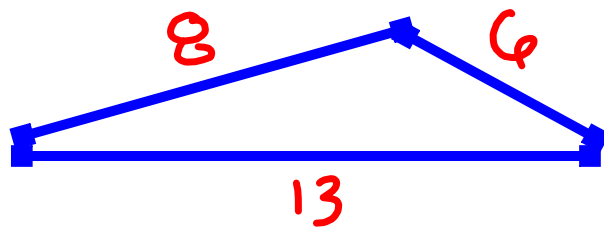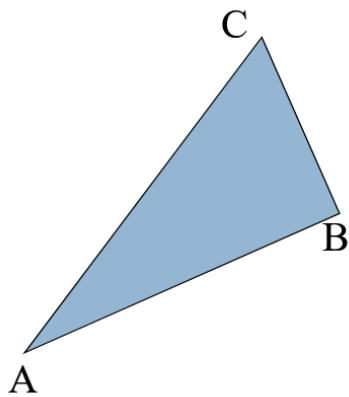X 22° 30° Z

Right Triangles

In a right triangle, the __hypotenuse__ is the side with the greatest measure.

7-4 Triangle Inequality Theorem

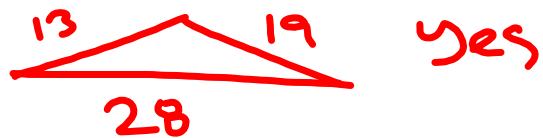The _Sum_ of the measure of any two sides of a triangle is _greater_ _than_ the third side.

C

B

A

8   6

13

Ex. 1 Determine if the three numbers can be measures of the sides of a triangle. If no, explain.

a. 13, 28, 19

$13 + 19 = 32$

13   19   yes

28

b. 9, 4, 4

$4 + 4 = 8$ no

c. 9, 7, 2

$7 + 2 = 9$ no

Ex. 2 If two sides of a triangle have the following measures, find the range of possible measures of the third side.

a. 10, 7, x

10, 7

$x < 17$

7, 10

$x > 3$

$3 < x < 17$

Diff. of 2 sides   Sum of 2 sides

b. 18, 11, x

$7 < x < 29$

Geometry   Name_____   ID: 1
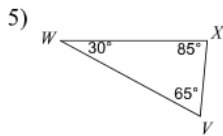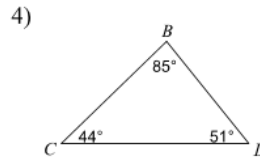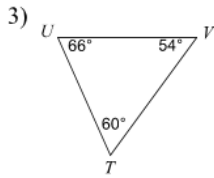© 2017 Kuta Software LLC. All rights reserved.
Triangle Inequality CW
                                      Date_____   Period_____

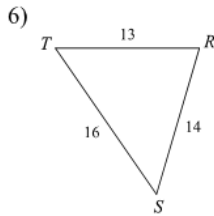**Order the sides of each triangle from shortest to longest.**
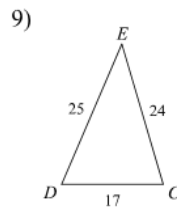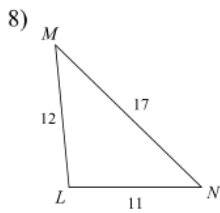
1)   △LMN

$\overline{NL}, \overline{LM}, \overline{MN}$

Triangle with vertices M (45°), N (50°), L (85°).

2) $\overline{LK}, \overline{ML}, \overline{KM}$

Triangle with vertices K (60°), M (50°), L (70°).

3)

Triangle with vertices U (66°), V (54°), T (60°).

4)

Triangle with vertices B (85°), C (44°), D (51°).

5)

Triangle with vertices W (30°), X (85°), V (65°).

Order the angles in each triangle from smallest to largest.

6)

Triangle T R S with sides: TR = 13, TS = 16, RS = 14.

7)   ∠F, ∠D, ∠E

Triangle with vertices D, F, E; sides DF = 21, DE = 19, FE = 20.

8)

Triangle M L N with sides: MN = 17, ML = 12, LN = 11.

9)

Triangle E D C with sides: ED = 25, EC = 24, DC = 17.

10)

Q
25   13
S ———— R
23
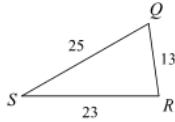
State if the three numbers can be the measures of the sides of a triangle.

11) 14, 6, 8   *2 < x < 14*
   6+8 = 14
   8 - 6 = 2   **NO!.**

12) 11, 8, 6   *2 < x < 14*
   6+8 = 14   **yes!!**
   8 - 6 = 2

13) 8, 12, 6   *12+6 = 18*
   12 - 6 = 6   *6 < x < 18 yes*

14) 5, 12, 7   *5+7 = 12*
   7 - 7 = 2   **No!.** *2 < x < 12*

15) 6, 12, 6

16) 4, 9, 6

17) 3, 12, 12

18) 11, 9, 4

19) 12, 4, 8

20) 9, 16, 7

Two sides of a triangle have the following measures. Find the range of possible measures for the third side.

21) 12, 12   *12*   *12*   **0 < x < 24**
12 + 12 = 24
12 - 12 = 0

22) 7, 6

23) 11, 11   *x*   *12   12*
    24   *12 | 12*

24) 7, 8

25) 12, 10

-2-

10

Answers to Triangle Inequality CW (ID: 1)

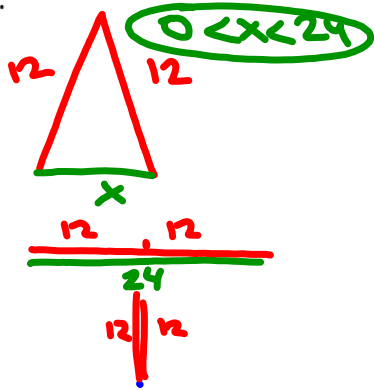1) $\overline{NL}, \overline{ML}, \overline{NM}$ 2) $\overline{KL}, \overline{LM}, \overline{KM}$ 3) $\overline{TU}, \overline{UV}, \overline{TV}$ 4) $\overline{DB}, \overline{CB}, \overline{DC}$
5) $\overline{VX}, \overline{WX}, \overline{VW}$ 6) $\angle S, \angle T, \angle R$ 7) $\angle F, \angle D, \angle E$ 8) $\angle M, \angle N, \angle L$
9) $\angle E, \angle D, \angle C$ 10) $\angle S, \angle Q, \angle R$ 11) No 12) Yes
13) Yes 14) No 15) No 16) Yes
17) Yes 18) Yes 19) No 20) No
21) $0 < x < 24$ 22) $1 < x < 13$ 23) $0 < x < 22$ 24) $1 < x < 15$
25) $2 < x < 22$

-3-

https://studentportal.educationincites.com/#/client/gacobb

△ HEW

△ BRT