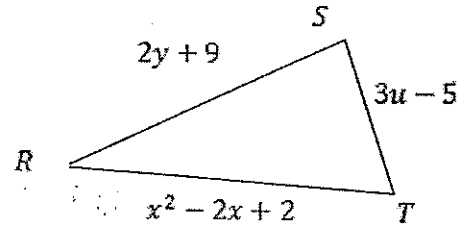


Name: \_\_\_\_\_

Geometry Post-Final Challenge Problem:

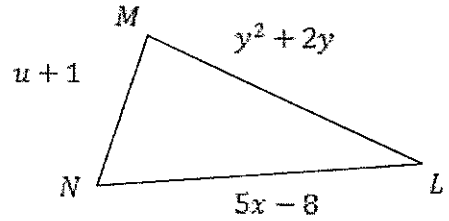
Given:  $\triangle RST \cong \triangle LMN$

1. Find all values for  $x$ ,  $y$ , and  $u$ .



2. Determine all the various lengths for  $\triangle RST$ 's sides, based upon the variables' values. Then use Triangle Inequality Theorem to determine the possible lengths.

RS	ST	TR	Is this a possible triangle?



**EXAMPLE 1** Solve quadratic equations by finding square rootsSolve the equation  $4x^2 - 3 = 109$ .

$$4x^2 - 3 = 109 \quad \text{Write original equation.}$$

$$4x^2 = 112 \quad \text{Add 3 to each side.}$$

$$x^2 = 28 \quad \text{Divide each side by 4.}$$

$$x = \pm\sqrt{28} \quad \sqrt{ab} = \sqrt{a} \cdot \sqrt{b}, \text{ so } \sqrt{28} = \pm\sqrt{4} \cdot \sqrt{7}.$$

$$x = \pm 2\sqrt{7} \quad \text{Simplify.}$$

**EXAMPLE 2** Simplify quotients with radicals

Simplify the expression.

a.  $\sqrt{\frac{10}{8}}$

b.  $\sqrt{\frac{1}{5}}$

**Solution**

a.  $\sqrt{\frac{10}{8}} = \sqrt{\frac{5}{4}}$  Simplify fraction.

$$= \frac{\sqrt{5}}{\sqrt{4}} \quad \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$= \frac{\sqrt{5}}{2} \quad \text{Simplify.}$$

b.  $\sqrt{\frac{1}{5}} = \frac{1}{\sqrt{5}}$

$$= \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \frac{\sqrt{5}}{5}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \text{ and } \sqrt{1} = 1.$$

Multiply numerator and denominator by  $\sqrt{5}$ .Multiply fractions.  
 $\sqrt{a} \cdot \sqrt{a} = a.$ **EXERCISES**Solve the equation or write *no solution*.

1.  $x^2 + 8 = 108$

2.  $2x^2 - 1 = 49$

3.  $x^2 - 9 = 8$

4.  $5x^2 + 11 = 1$

5.  $2(x^2 - 7) = 6$

6.  $9 = 21 + 3x^2$

7.  $3x^2 - 17 = 43$

8.  $56 - x^2 = 20$

9.  $-3(-x^2 + 5) = 39$

Simplify the expression.

10.  $\sqrt{\frac{7}{81}}$

11.  $\sqrt{\frac{3}{5}}$

12.  $\sqrt{\frac{24}{27}}$

13.  $\frac{3\sqrt{7}}{\sqrt{12}}$

14.  $\sqrt{\frac{75}{64}}$

15.  $\frac{\sqrt{2}}{\sqrt{200}}$

16.  $\frac{9}{\sqrt{27}}$

17.  $\sqrt{\frac{21}{42}}$