

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

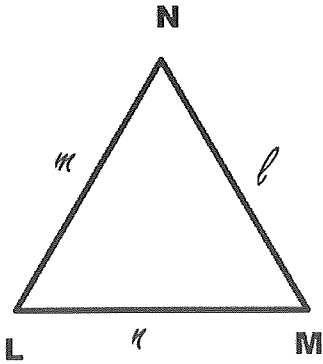
Hour: \_\_\_\_\_

## Law of Cosines Homework #2

### Solving for the Triangle

Directions: Solve the triangle for  $\triangle LMN$  Round to the nearest tenth if needed.

1.  $m=44$ ,  $l=54$ , and  $\angle N=23^\circ$ .

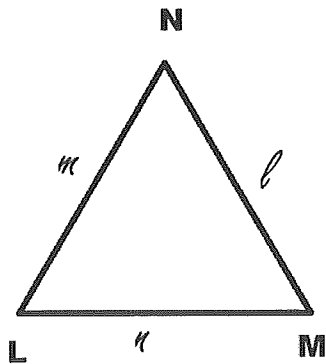


$n =$  \_\_\_\_\_

$\angle M =$  \_\_\_\_\_

$\angle L =$  \_\_\_\_\_

2.  $m=15$ ,  $l=14$ , and  $n=16$ .



$\angle N =$  \_\_\_\_\_

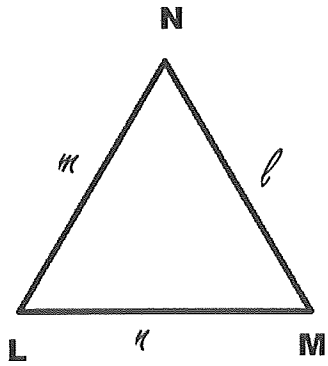
$\angle M =$  \_\_\_\_\_

$\angle L =$  \_\_\_\_\_

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

Hour: \_\_\_\_\_

3.  $n=10.3$ ,  $l=9.5$ , and  $\angle M = 37^\circ$ .

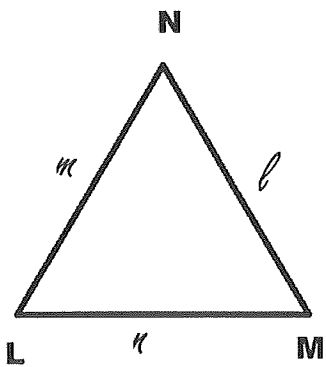


$m =$  \_\_\_\_\_

$\angle N =$  \_\_\_\_\_

$\angle L =$  \_\_\_\_\_

4.  $m=15$ ,  $l=19$ , and  $n = 28$ .



$\angle N =$  \_\_\_\_\_

$\angle M =$  \_\_\_\_\_

$\angle L =$  \_\_\_\_\_

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

Hour: \_\_\_\_\_

**Key**Law of Cosines Homework #2Solving for the TriangleDirections: Solve the triangle for  $\triangle LMN$  Round to the nearest tenth if needed.

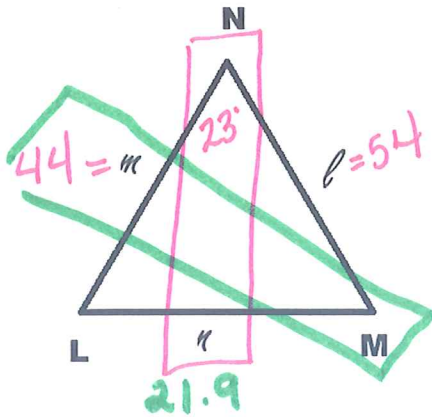
1.  $m=44$ ,  $l=54$ , and  $\angle N=23^\circ$ . Find  $n$   
 $n^2 = 54^2 + 44^2 - 2 \cdot 54 \cdot 44 \cos(23)$   
 $n^2 = 477.761$

$$\boxed{n = 21.9}$$

$$n = \underline{21.9}$$

$$\angle M = \underline{51.7^\circ}$$

$$\angle L = \underline{105.3^\circ}$$

Find  $\angle M$ 

$$\frac{\sin M}{44} = \frac{\sin(23)}{21.9}$$

$$\sin M = \frac{44 \cdot \sin(23)}{21.9}$$

$$\angle M = \sin^{-1}\left(\frac{44 \sin(23)}{21.9}\right) = 51.7^\circ$$

2.  $m=15$ ,  $l=14$ , and  $n=16$ .

Find  $\angle N$ 

$$16^2 = 14^2 + 15^2 - 2 \cdot 14 \cdot 15 \cos N$$

$$256 = 421 - 420 \cos N$$

$$-421 \quad -421$$

$$\frac{-165}{-420} = \frac{-420 \cos N}{-420}$$

$$\cos N = \left(\frac{-165}{-420}\right)$$

$$\angle N = \cos^{-1}\left(\frac{-165}{-420}\right)$$

$$\boxed{\angle N = 66.9^\circ}$$

$$\angle N = \underline{66.9^\circ}$$

$$\angle M = \underline{59.6^\circ}$$

$$\Delta \text{ sum}$$

$$\angle L = \underline{53.5^\circ}$$

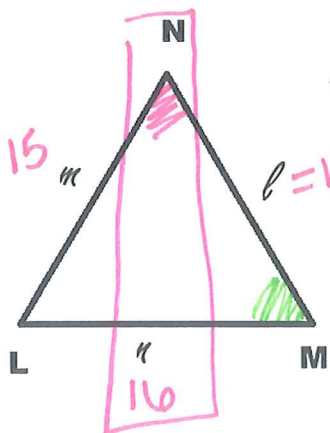
Find  $\angle M$ 

$$\frac{\sin(66.9)}{16} = \frac{\sin M}{15}$$

$$\sin M = \frac{15 \cdot \sin(66.9)}{16}$$

$$\angle M = \sin^{-1}\left(\frac{15 \cdot \sin(66.9)}{16}\right)$$

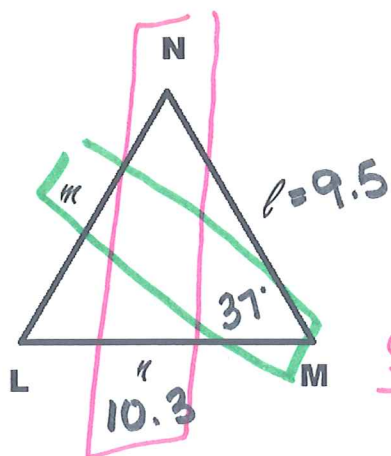
$$\boxed{\angle M = 59.6^\circ}$$



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

Hour: \_\_\_\_\_

3.  $n=10.3$ ,  $l=9.5$ , and  $\angle M = 37^\circ$ .



Find m

$$m^2 = 9.5^2 + 10.3^2 - 2 \cdot 9.5 \cdot 10.3 \cos(37^\circ) \quad m = \underline{6.3}$$

$$m^2 = 40.047$$

$$m = 6.3$$

$$\angle n = \underline{79.7^\circ}$$

$$\angle L = \underline{63.3^\circ}$$

Δ Sum

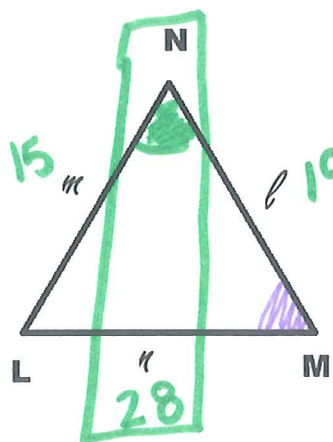
$$\frac{\sin N}{10.3} = \frac{\sin(37^\circ)}{6.3}$$

$$\sin N = \frac{10.3 \cdot \sin(37^\circ)}{6.3}$$

$$\angle N = \sin^{-1} \left( \frac{10.3 \cdot \sin(37^\circ)}{6.3} \right)$$

$$\boxed{m \angle N = 79.7^\circ}$$

4.  $m=15$ ,  $l=19$ , and  $n = 28$ .



$$28^2 = 19^2 + 15^2 - 2 \cdot 19 \cdot 15 \cos N$$

$$784 = 586 - 570 \cos N$$

-586    -586

$$\frac{198}{-570} = \frac{-570 \cos N}{-570}$$

$$\cos N = \frac{198}{-570}$$

$$\angle N = \cos^{-1} \left( \frac{198}{-570} \right)$$

$$\angle N = \underline{110.3^\circ}$$

$$\angle M = \underline{30.2^\circ}$$

$$\angle L = \underline{39.5^\circ}$$

Δ Sum

$$\boxed{\angle N = 110.3^\circ}$$

Find  $\angle M$

$$\frac{\sin M}{15} = \frac{\sin(110.3^\circ)}{28}$$

$$\sin M = \frac{15 \cdot \sin(110.3^\circ)}{28}$$

$$\angle M = \sin^{-1} \left( \frac{15 \cdot \sin(110.3^\circ)}{28} \right)$$

$$\angle M = 30.2^\circ$$