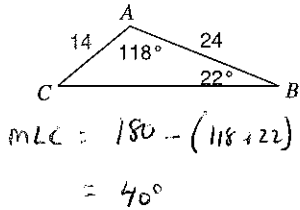


## The Law of Sines

Date \_\_\_\_\_ Period \_\_\_\_\_

Find each measurement indicated. Round your answers to the nearest tenth.

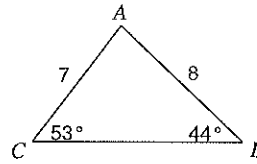
1) Find AC



$$\frac{\sin 40}{24} = \frac{\sin 22}{AC}$$

$$AC \approx 13.987$$

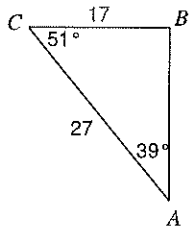
2) Find AB



$$\frac{\sin 44}{7} = \frac{\sin 53}{AB}$$

$$AB \approx 8.048$$

3) Find BC



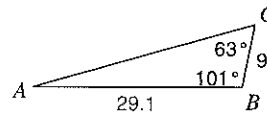
$$m\angle B = 180 - (51 + 39)$$

$$= 90^\circ$$

$$\sin 39 = \frac{BC}{27}$$

$$BC \approx 16.992$$

4) Find AB



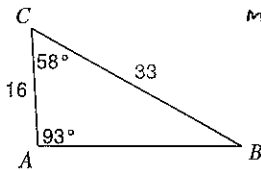
$$m\angle A = 180 - (101 + 63)$$

$$= 16^\circ$$

$$\frac{\sin 16}{9} = \frac{\sin 63}{AB}$$

$$AB \approx 29.093$$

5) Find BC

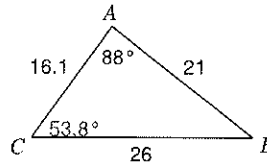


$$m\angle B = 180 - (93 + 58)$$

$$= 29^\circ$$

$$\frac{\sin 29}{16} = \frac{\sin 93}{BC}$$

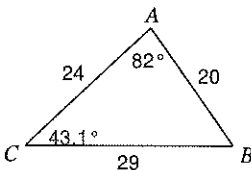
$$BC \approx 32.957$$

6) Find  $m\angle C$ 

$$\frac{\sin 88}{26} = \frac{\sin C}{21}$$

$$\sin C = .8072002$$

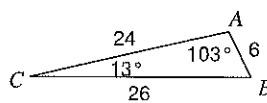
$$C = 53.823^\circ$$

7) Find  $m\angle C$ 

$$\frac{\sin 82}{29} = \frac{\sin C}{20}$$

$$\sin C \approx .682943$$

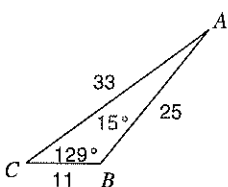
$$C = 43.074^\circ$$

8) Find  $m\angle C$ 

$$\frac{\sin 103}{26} = \frac{\sin C}{6}$$

$$\sin C = .2248546$$

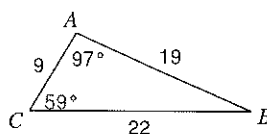
$$C \approx 12.994^\circ$$

9) Find  $m\angle A$ 

$$\frac{\sin 129}{33} = \frac{\sin A}{11}$$

$$\sin A \approx .259049$$

$$A = 15.014^\circ$$

10) Find  $m\angle C$ 

$$\frac{\sin 97}{22} = \frac{\sin C}{19}$$

$$\sin C = .8571989$$

$$C = 59.004^\circ$$

Solve each triangle. Round your answers to the nearest tenth.

11)  $m\angle A = 70^\circ$ ,  $c = 26$ ,  $a = 25$

$m\angle B = 32.2^\circ$ ,  $m\angle C = 77.8^\circ$ ,  $b = 14.2$

Or  $m\angle B = 7.8^\circ$ ,  $m\angle C = 102.2^\circ$ ,  $b = 3.6$

13)  $m\angle C = 145^\circ$ ,  $b = 7$ ,  $c = 33$

$m\angle A = 28^\circ$ ,  $m\angle B = 7^\circ$ ,  $a = 27$

15)  $m\angle B = 117^\circ$ ,  $a = 16$ ,  $b = 38$

$m\angle C = 41^\circ$ ,  $m\angle A = 22^\circ$ ,  $c = 28$

17)  $m\angle B = 105^\circ$ ,  $b = 23$ ,  $a = 14$

$m\angle C = 39^\circ$ ,  $m\angle A = 36^\circ$ ,  $c = 15$

12)  $m\angle B = 45^\circ$ ,  $a = 28$ ,  $b = 27$

$m\angle C = 87.8^\circ$ ,  $m\angle A = 47.2^\circ$ ,  $c = 38.2$

Or  $m\angle C = 2.2^\circ$ ,  $m\angle A = 132.8^\circ$ ,  $c = 1.5$

14)  $m\angle B = 73^\circ$ ,  $a = 7$ ,  $b = 5$

Not a triangle

16)  $m\angle B = 84^\circ$ ,  $a = 18$ ,  $b = 9$

Not a triangle

18)  $m\angle C = 13^\circ$ ,  $m\angle A = 22^\circ$ ,  $c = 9$

$m\angle B = 145^\circ$ ,  $a = 15$ ,  $b = 22.9$

State the number of possible triangles that can be formed using the given measurements.

19)  $m\angle C = 63^\circ$ ,  $b = 9$ ,  $c = 12$

One triangle

20)  $m\angle B = 33^\circ$ ,  $a = 27$ ,  $b = 22$

Two triangles

21)  $m\angle B = 29^\circ$ ,  $a = 14$ ,  $b = 19$

One triangle

22)  $m\angle B = 95^\circ$ ,  $b = 24$ ,  $a = 5$

One triangle

23)  $m\angle A = 29^\circ$ ,  $c = 18$ ,  $a = 17$

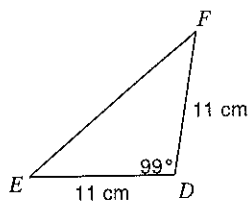
Two triangles

24)  $m\angle B = 35^\circ$ ,  $a = 24$ ,  $b = 6$

None

Find the area of each triangle to the nearest tenth.

25)



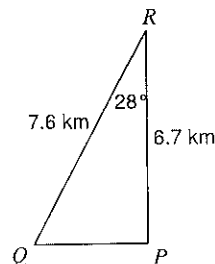
$59.8 \text{ cm}^2$

$A = \frac{1}{2} ab \sin C$

$= \frac{1}{2} (11)(11) \sin 99^\circ$

$= 59.755$

26)



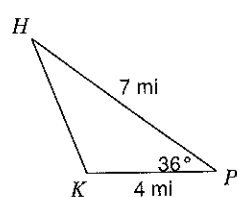
$12 \text{ km}^2$

$A = \frac{1}{2} ab \sin C$

$= \frac{1}{2} (7.6)(6.7) \sin 28^\circ$

$\approx 11.953$

27)



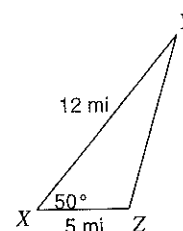
$8.2 \text{ mi}^2$

$A = \frac{1}{2} ab \sin C$

$= \frac{1}{2} (4)(7) \sin 36^\circ$

$\approx 8.229$

28)



$23 \text{ mi}^2$

$A = \frac{1}{2} ab \sin C$

$= \frac{1}{2} (5)(12) \sin 50^\circ$

$\approx 22.981$