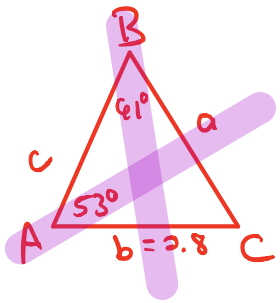
More Trig – Law of Sines

Hw Section 10.2 Name_____

Use the given information to find each value. Round the sides to the nearest tenth and the angles to the nearest whole number.

#1) If m∠A = 53°, m∠B = 61°, and b = 2.8, find a.



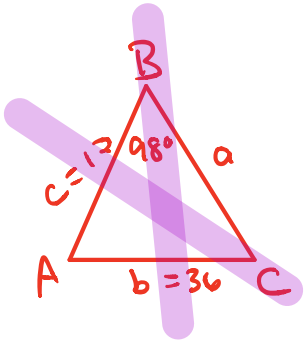
$$\frac{\sin(61^\circ)}{2.8} = \frac{\sin(53^\circ)}{a}$$

$$a \cdot \sin(61^\circ) = 2.8 \sin(53^\circ)$$

$$a = \frac{2.8 \sin(53^\circ)}{\sin(61^\circ)}$$

$$a \approx 2.6$$

#2) If m∠B = 98°, c = 12 and b = 36, find m∠C.



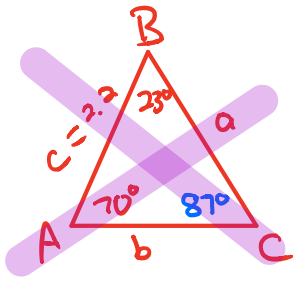
$$\frac{\sin(98^\circ)}{36} = \frac{\sin(m\angle C)}{12}$$

$$\frac{12 \sin(98^\circ)}{36} = \sin(m\angle C)$$

$$\sin^{-1}\left(\frac{12 \sin 98^\circ}{36}\right) = m\angle C$$

$$19^\circ \approx m\angle C$$

#3) If c = 2.2, m∠A = 70°, and m∠B = 23°, find a.



$$m\angle C + 23^\circ + 70^\circ = 180^\circ$$

$$m\angle C + 93^\circ = 180^\circ$$

$$m\angle C = 87^\circ$$

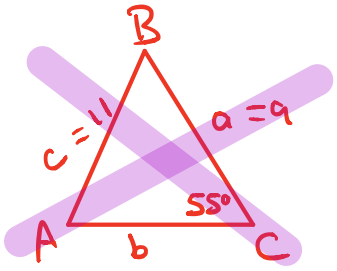
$$\frac{\sin(87^\circ)}{2.2} = \frac{\sin(70^\circ)}{a}$$

$$a \cdot \sin(87^\circ) = 2.2 \sin(70^\circ)$$

$$a = \frac{2.2 \sin(70^\circ)}{\sin(87^\circ)}$$

$$a \approx 2.1$$

#4) If m∠C = 55°, c = 11 and a = 9, find m∠A.



$$\frac{\sin(55^\circ)}{11} = \frac{\sin(m\angle A)}{9}$$

$$\frac{9 \sin(55^\circ)}{11} = \sin(m\angle A)$$

$$\sin^{-1}\left(\frac{9 \sin(55^\circ)}{11}\right) = m\angle A$$

$$42^\circ \approx m\angle A$$

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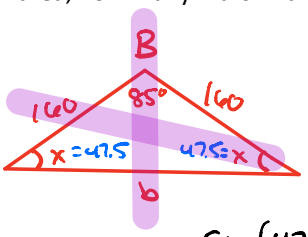
For the following, round the sides to the nearest tenth and the angles to the nearest whole number.

#5) George fenced in a triangular area for his pet parakeet. Two sides of the area are 160 marshmallows long and they meet at an angle of 85°. If a fence is to be built around the area, how many marshmallows of fencing will be needed?



$85 + 2x = 180$

$2x = 95$

$x = 47.5$

$$\frac{\sin(47.5°)}{160} = \frac{\sin(85°)}{b}$$

$$b\sin(47.5°) = 160\sin(85°)$$

$$b = \frac{160\sin(85°)}{\sin(47.5°)}$$

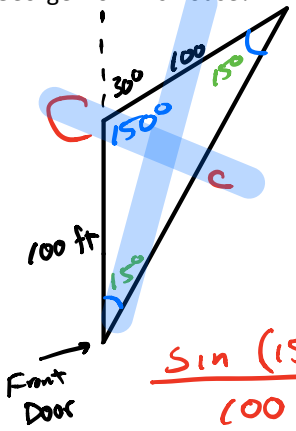
$b \approx 216.2$

$P = 160 + 160 + 216.2$

$P = 536.2$

George needs about 536.2 marshmallows.

#6) George decides to leave his house and go on an adventure with his favorite Cabbage Patch Doll. From his front door, George walks due north for 100 feet. Then, he turns 30° east of north and walks 100 more feet. How far is George from his house?



$30 + x = 180$

$x = 150$

$150 + 2y = 180$

$2y = 30$

$y = 15$

$$\frac{\sin(15°)}{100} = \frac{\sin(150°)}{c}$$

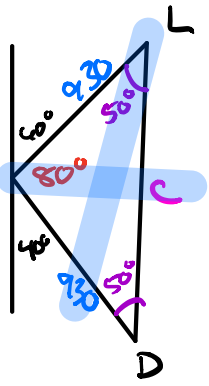
$$c\cdot\sin(15°) = 100\sin(150°)$$

$$c = \frac{100\sin(150°)}{\sin(15°)}$$

$c \approx 193.2$

George is about 193.2 feet from his house.

#7) Two of George's Teenage Mutant Ninja Turtles leave George's house at the same time. Both turtles, Leonardo and Donatello, travel at a speed of 310 miles per hour. Leo runs in the direction of 60° east of north while Don travels 40° east of south. How far apart are the two Turtles after 3 hours?



$60 + 40 + x = 180$

$100 + x = 180$

$x = 80$

$D = r\cdot t$

$D = (310)(3)$

$D = 930$

$80 + 2y = 180$

$2y = 100$

$y = 50$

$$\frac{\sin(50°)}{930} = \frac{\sin(80°)}{c}$$

$$c\cdot\sin(50°) = 930\sin(80°)$$

$$c = \frac{930\sin(80°)}{\sin(50°)}$$

$c \approx 1195.6$

Leo and Don are about 1195.6 miles apart.