

Hw 9.2 Homework

Find the area of each oblique triangle described below. Draw and label the triangle and show your work.

1. $b = 3$ $c = 8$ $m \angle A = 120^\circ$

$$A = \frac{1}{2}bc \cdot \sin A$$

$$A = \frac{1}{2}(3)(8) \sin(120^\circ)$$

$$A = 10.392 \text{ un}^2$$

2. $a = 10$ $b = 20$ $m \angle C = 70^\circ$

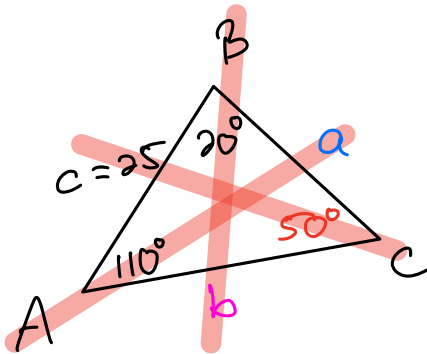
$$A = \frac{1}{2}ab \sin C$$

$$A = \frac{1}{2}(10)(20) \sin(70^\circ)$$

$$A \approx 93.969 \text{ un}^2$$

Solve each of the oblique triangles described below. You may need to use a combination of the Law of Sines and Law of Cosines. Draw and label each triangle and show all of your work.

3. $c = 25$ $m\angle A = 110^\circ$ $m\angle B = 20^\circ$



$$m\angle C + 110^\circ + 20^\circ = 180^\circ$$

$$m\angle C = 50^\circ$$

$$\frac{\sin(50^\circ)}{25} = \frac{\sin(20^\circ)}{b}$$

$$b \cdot \sin(50^\circ) = 25 \sin(20^\circ)$$

$$b = \frac{25 \sin(20^\circ)}{\sin(50^\circ)}$$

$$b \approx 11.162$$

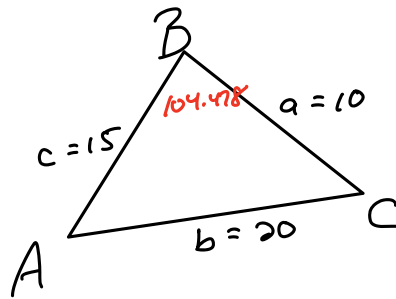
$$\frac{\sin(50^\circ)}{25} = \frac{\sin(110^\circ)}{a}$$

$$a \cdot \sin(50^\circ) = 25 \cdot \sin(110^\circ)$$

$$a = \frac{25 \cdot \sin(110^\circ)}{\sin(50^\circ)}$$

$$a \approx 30.667$$

4. $a = 10$ $b = 20$ $c = 15$



Use Cosine to find largest angle.

$$b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$$

$$20^2 = 10^2 + 15^2 - 2(10)(15) \cdot \cos(B)$$

$$400 = 100 + 225 - 300 \cos(B)$$

$$400 = 325 - 300 \cos(B)$$

$$75 = -300 \cos(B)$$

$$\frac{75}{-300} = \cos(B)$$

$$B = \cos^{-1}\left(\frac{75}{-300}\right)$$

$$B \approx 104.478$$

$$\frac{\sin(104.478^\circ)}{20} = \frac{\sin C}{15}$$

$$\frac{15 \cdot \sin(104.478^\circ)}{20} = \sin C$$

$$\sin^{-1}\left[\frac{15 \cdot \sin(104.478^\circ)}{20}\right] = C$$

$$C \approx 46.567^\circ$$

$$m\angle A + 104.478^\circ + 46.567^\circ = 180^\circ$$

$$m\angle A \approx 28.955^\circ$$