

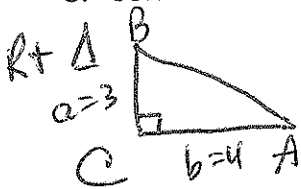
Practice Set #2 for Trigonometry Final

# ANSWER KEY

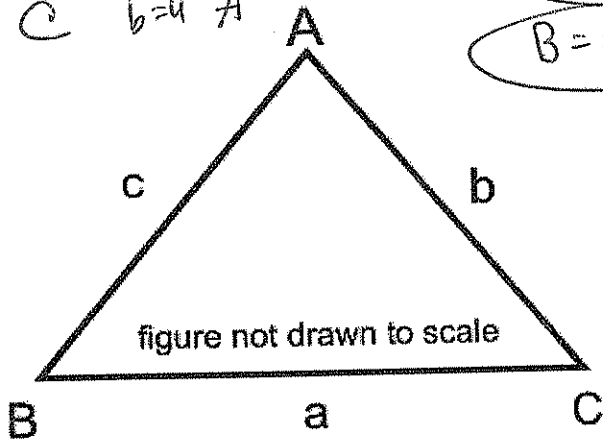
For each of the following functions state the 1. Amplitude 2. Period 3. Vertical Translation and 4. Horizontal Translation, then graph each function.

1.  $y = -2 \sec(4x + \pi) + 3$       2.  $y = -4 \cot(2x - \frac{\pi}{2}) - 1$

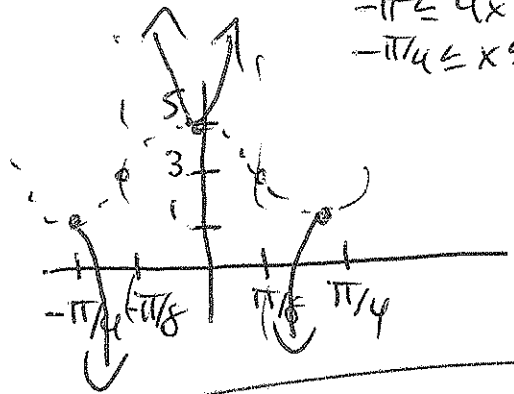
3. Solve the triangle if  $a=3, b=4, \angle C=90^\circ$



$c=5$   
 $\tan A = \frac{3}{4}$   
 $A = 36.9^\circ$   
 $B = 53.1^\circ$



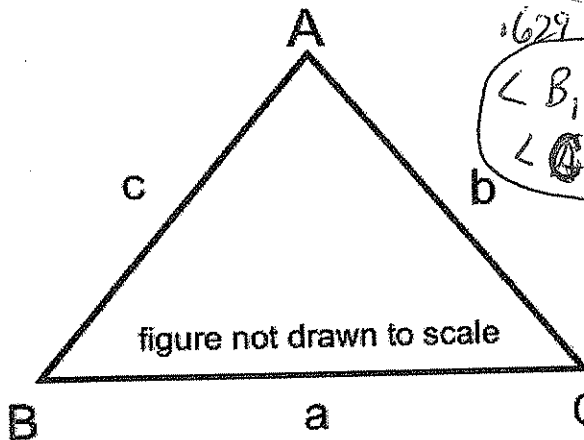
#1 Amplitude = N/A Period =  $\pi/2$   
 $y = -2 \sec 4(x + \frac{\pi}{4}) + 3$   
 vert  $\uparrow 3$  hor:  $x \in \pi/4$   
 interval:  $0 \leq 4x + \pi \leq 2\pi$   
 $-\pi \leq 4x \leq \pi$   
 $-\pi/4 \leq x \leq \pi/4$



4. Solve the triangle if  $A=39^\circ, a=9.7 \text{ km}, b=11.8 \text{ km}$   
 (2 solutions)

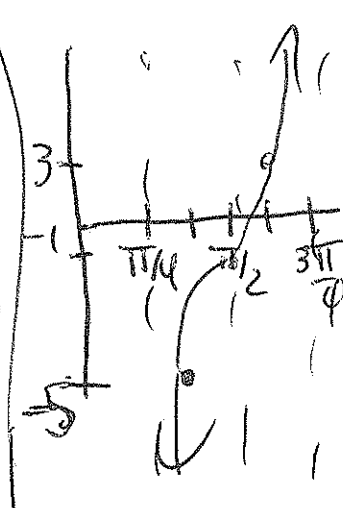
$\frac{9.7}{\sin 39^\circ} = \frac{11.8}{\sin B}$   
 $\frac{9.7}{.629} = \frac{11.8}{\sin B}$

$\angle B_1 = 50^\circ$   
 $\angle C_1 = 91^\circ$   
 $c_2 = 15.4 \text{ km}$



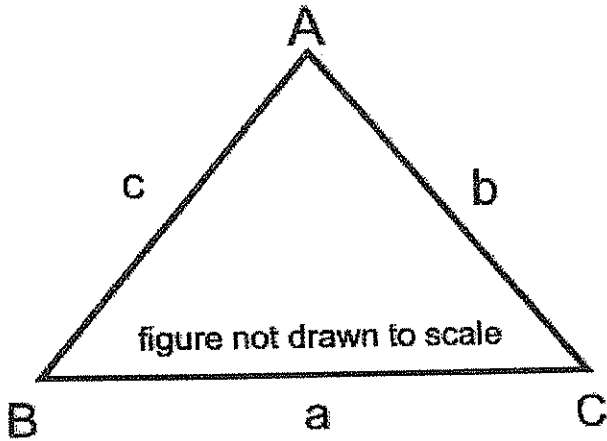
$\angle B_2 = 130^\circ$   
 $\angle C_2 = 11^\circ$   
 $c_2 = 2.9 \text{ km}$

#2  $y = -4 \cot 2(x - \frac{\pi}{2}) - 1$   
 Amplitude = N/A Period =  $\pi/2$   
 vert  $\downarrow 1$  hor:  $x \rightarrow \pi/2$   
 interval:  $0 \leq 2x - \frac{\pi}{2} \leq \pi$   
 $\pi/2 \leq 2x \leq 3\pi/2$   
 $\pi/4 \leq x \leq 3\pi/4$



5. Find the area of a triangle if  $a = 22$ ,  $b = 45$ , and  $c = 31$

~~Area = 210 in<sup>2</sup>~~



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$22^2 = 45^2 + 31^2 - 2(45)(31) \cos A$$

$$484 = 2025 + 961 - 2790 \cos A$$

$$484 = 2986 - 2790 \cos A$$

$$-2502 = -2790 \cos A$$

$$.8967 = \cos A \quad A = 26.3^\circ$$

$$A = \frac{1}{2} ab \sin C = \frac{1}{2} (22)(45) \sin 26.3^\circ$$

Area = 219.3 in<sup>2</sup>

6. Given  $\tan \theta = \frac{3}{7}$ , find the other 5 trig functions

$\cot \theta = 7/3$  ( $r = \sqrt{58}$ ) ( $\theta$  in Q1)

$\sin \theta = \frac{3\sqrt{58}}{58}$   $\csc \theta = \frac{\sqrt{58}}{3}$   $\cos \theta = \frac{7\sqrt{58}}{58}$   $\sec \theta = \frac{\sqrt{58}}{7}$

7. Find each exact value:

a)  $\sin 75^\circ$

$\frac{\sqrt{6} + \sqrt{2}}{4}$

b)  $\tan 75^\circ$

$2 + \sqrt{3}$

Given  $\cos \theta = \frac{2}{3}$ ,  $\theta$  in quadrant IV and  $\sin \beta = \frac{3}{7}$ ,  $\theta$  in quadrant II

$\cos \beta = -\frac{2\sqrt{10}}{7}$ ,  ~~$\sin \theta = \frac{2\sqrt{5}}{3}$~~   
 ~~$\sin \theta = -\frac{\sqrt{5}}{3}$~~

8. Find  $\cos(\theta + \beta)$

9. Find  $\sin(\beta - \theta)$

$$\cos \theta \cdot \cos \beta - \sin \theta \cdot \sin \beta$$

$$\left(\frac{2}{3}\right) \left(-\frac{2\sqrt{10}}{7}\right) - \left(-\frac{\sqrt{5}}{3}\right) \left(\frac{3}{7}\right)$$

$$\frac{-4\sqrt{10} + 3\sqrt{5}}{21}$$

$$\sin \beta \cdot \cos \theta - \cos \beta \cdot \sin \theta$$

$$\left(\frac{3}{7}\right) \left(\frac{2}{3}\right) - \left(-\frac{2\sqrt{10}}{7}\right) \left(-\frac{\sqrt{5}}{3}\right)$$

$$\frac{6 - 2\sqrt{50}}{21}$$