

## Pre-Calculus Homework #14

- 1) If angle  $B = 112^{\circ}34'48''$ , angle  $A = 27^{\circ}31'24''$ , and side  $c = 59$ , solve all possible triangles and find the area of each. Give all angles in degrees, minutes, and seconds rounded to the nearest tenth of a second and round all sides and the areas to one decimal place.
- 2) Two airplanes leave the same airport at the same time on different runways. One plane flies with a heading of  $321^{\circ}$  at a speed of 378 miles per hour while the other plane flies with a heading of  $104^{\circ}$  at a speed of 313 miles per hour. After 4 hours, how far are the planes away from each other? (round your answer to one decimal place)
- 3) If side  $a = 27$ , side  $b = 49$ , and side  $c = 58$ , solve all possible triangles and find the area of each. Give all angles in degrees, minutes, and seconds rounded to the nearest tenth of a second and round all sides and the areas to one decimal place.
- 4) Joshua leaves his house and walks at a rate of 2 miles per hour for 4 hours at a bearing of  $S24^{\circ}W$  after a short break, he resumes his trip but now he jogs at a rate of 4 miles per hour for 5 hours at a bearing of  $S58^{\circ}E$ . If Emily is at Joshua's house and wants to walk directly to the spot where Joshua ended his trip, how far must she walk and at what bearing? (round your answers to one decimal place)
- 5) If side  $a = 41$ , angle  $C = 35.6^{\circ}$ , and side  $c = 36$ , solve all possible triangles and find the area of each. Round all angles, sides, and areas to one decimal place.
- 6) 
$$\frac{1 + \cos x}{\sin x} + \frac{\sin x}{\cos x} = \frac{\cos x + 1}{\sin x \cos x}$$
- 7) 
$$\frac{1 + \tan \theta}{1 + \cot \theta} = \frac{\sec \theta}{\csc \theta}$$
- 8) 
$$\frac{\sin y + \cos y}{\sec y + \csc y} = \frac{\sin y}{\sec y}$$
- 9) 
$$\frac{\sec^2 x}{2 - \sec^2 x} = \sec 2x$$
- 10) 
$$\tan x + \cot y = \frac{\cos(x - y)}{\cos x \sin y}$$
- 11) 
$$\cos 2\theta = \cos^4 \theta - \sin^4 \theta$$
- 12) 
$$\frac{2 \tan x}{1 - \tan^2 x} = \frac{\tan 3x - \tan x}{1 + \tan 3x \tan x}$$
- 13) 
$$\frac{2 + \sin 2\theta}{2} = \frac{\cos^3 \theta - \sin^3 \theta}{\cos \theta - \sin \theta}$$
- 14) 
$$-\sin^2 \beta = \cos^2 \beta (1 - \sec^2 \beta)$$

$$15) 1 + \tan \alpha = \frac{\cos \alpha + \sin \alpha}{\cos \alpha}$$

$$16) \frac{\tan \theta + \cot \theta}{\csc \theta} = \sec \theta$$

$$17) (\sec \beta - \csc \beta)(\sin \beta + \cos \beta) = \tan \beta - \cot \beta$$

$$18) \frac{\tan y + \cot y}{\sec y + \csc y} = \frac{1}{\cos y + \sin y}$$

$$19) \frac{\csc x + 1}{\cot x} = \frac{\cot x}{\csc x - 1}$$

$$20) \sec^4 \beta - \tan^2 \beta = \tan^4 \beta + \sec^2 \beta$$