PreCalculus

Unit 5: Analytic Trig Review

Name _____

Date _____

Solve each equation.

1) $4\cos^2 x - 3 = 0$

2) $2\sin^2 x - \sin x - 3 = 0, \quad 0 \le x < 2\pi$

3) $\sin(3\theta) = -1, \quad 0 \le \theta < 2\pi$

4) $\sqrt{3} + \tan(2\theta) = 0, \quad 0 \le x < 2\pi$

5) $\sin\left(\frac{\theta}{2}\right) - 1 = 0$

6) $\sec\left(x - \frac{\pi}{5}\right) = 2, \quad 0 \le x < 2\pi$

7) $4\cos^2 x + 4\cos x - 3 = 0, \quad 0 \le x < 2\pi$

8) $2\tan^2 x - \tan x - 6 = 0, \quad 0 \le x < 2\pi$

9) $\sin\theta = -0.2, \quad 0 \le \theta < 2\pi$

10) $\tan x = 5, \quad 0 \le x < 2\pi$

Determine the exact value of each trigonometric function using a sum/difference and then again using a half/double angle to verify.

11) $\cos\frac{7\pi}{12}$

12) $\tan\left(-\frac{\pi}{12}\right)$

13) $\sin\frac{5\pi}{12}$

Prove each trigonometric identity.

14) $\tan\theta\cot\theta - \sin^2\theta = \cos^2\theta$

15) $4\cos^2\theta + 3\sin^2\theta = 3 + \cos^2\theta$

16) $\frac{\csc\theta}{1+\csc\theta} = \frac{1-\sin\theta}{cos^2\theta}$

17) $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$

18) $\frac{\sin\theta+\cos\theta}{\sin\theta} - \frac{\cos\theta-\sin\theta}{\cos\theta} = \sec\theta\csc\theta$

19) $\sin(\alpha-\beta)\sin(\alpha+\beta) = \sin^2\alpha - \sin^2\beta$

20) $\cos(\alpha+\beta) + \cos(\alpha-\beta) = 2\cos\alpha\cos\beta$

21) $\frac{\cos(2\theta)}{1+\sin(2\theta)} = \frac{\cot\theta-1}{\cot\theta+1}$

22) $\frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} = 4\tan\theta\sec\theta$

23) $\frac{1-\sin x}{\cos x} = \frac{\cos x}{1+\sin x}$

24) $\frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)} = \frac{\tan\alpha + \tan\beta}{\tan\alpha - \tan\beta}$

25) $\frac{\cot\theta - \tan\theta}{\cot\theta + \tan\theta} = \cos(2\theta)$

26) $\tan\frac{\theta}{2} = \csc\theta - \cot\theta$

27) $\sin\left(\frac{3\pi}{2} + \theta\right) = -\cos\theta$

28) $\frac{\sin\left(x-\frac{\pi}{2}\right)}{\cos\left(x-\frac{\pi}{2}\right)} = -\cot x$

29) $sin^2x + 2cot^2\left(\frac{\pi}{2} - x\right) + cos^2x + \frac{1}{\csc x \sin x} = 2sec^2x$

Solve each triangle.

30) $B = 82°$, $b = 17$, $c = 15$

31) $c = 36°$, a= 17, $c = 16$

32) $A = 73°$, a= 24, $b = 28$

33) $a = 14, b = 17, c = 25$

34) $a = 12, b = 15, c = 28$

35) $A = 50°$, $b = 8, c = 6$