Precalc Review 6.1-6.4 Answers

(Answers can be degrees or radians)

1. 150° 2. 45° 3. 45° 4. 90° 5. 60° 6. 120° 7. ½

8. -45° 9. $\sqrt{5}$ 10. -.20 11. 2.55 12. 1.32

13. $\frac{3-\sqrt{3}}{3+\sqrt{3}}$ 14. $\frac{\sqrt{2}+\sqrt{6}}{4}$ 15. $\frac{1+\sqrt{3}}{1-\sqrt{3}}$ 16. $\frac{\sqrt{6}-\sqrt{2}}{4}$ 17. $\frac{-\sqrt{6}+\sqrt{2}}{4}$ 18. $\frac{\sqrt{3}}{2}$

19: *a.)* $\frac{2\sqrt{5}}{25}$ *b.)* $\frac{11\sqrt{5}}{25}$ *c.)* $\frac{2}{11}$

20) a.) $\frac{33}{65}$ b.) $\frac{-\sqrt{2}}{10}$

21. $csc\theta - sin\theta = \frac{1}{sin\theta} - sin\theta$

$= \frac{1-sin^2\theta}{sin\theta} = \frac{cos^2\theta}{sin\theta}$

$= cos\theta\frac{cos\theta}{sin\theta}$

$= cos\theta cot\theta$

22. $\cos\frac{\pi}{2}\cos\vartheta - \sin\frac{\pi}{2}\sin\vartheta = -\sin\vartheta$

$0\cos\vartheta - 1\sin\vartheta = \sin\vartheta$

$-\sin\vartheta = -\sin\vartheta$

24. $\csc^2\vartheta - \cot^2\vartheta = 1$

$(1+\cot^2\vartheta) - \cot^2\vartheta = 1$

$1 = 1$

23. $(\sin\alpha\cos\beta - \sin\beta\cos\alpha)(\sin\alpha\cos\beta + \sin\beta\cos\alpha) = \sin^2\alpha - \sin^2\beta$

$\sin^2\alpha\cos^2\beta - \sin^2\beta\cos^2\alpha = \sin^2\alpha - \sin^2\beta$

$\sin^2\alpha(1-\sin^2\beta) - \sin^2\beta(1-\sin^2\alpha) = \sin^2\alpha - \sin^2\beta$

$\sin^2\alpha - \sin^2\alpha\sin^2\beta - \sin^2\beta + \sin^2\alpha\sin^2\beta = \sin^2\alpha - \sin^2\beta$

$\sin^2\alpha - \sin^2\beta$

25. $\frac{1}{\sin\vartheta} - \frac{\cos\vartheta}{\sin\vartheta} = \frac{\sin\vartheta}{1+\cos\vartheta}$

$\frac{1+\cos\vartheta}{1+\cos\vartheta}\left(\frac{1-\cos\vartheta}{\sin\vartheta}\right) = \frac{\sin\vartheta}{1+\cos\vartheta}$

$\frac{1-\cos^2\vartheta}{\sin\vartheta(1+\cos\vartheta)} = \frac{\sin\vartheta}{1+\cos\vartheta}$

$\frac{\sin^2\vartheta}{\sin\vartheta(1+\cos\vartheta)} = \frac{\sin\vartheta}{1+\cos\vartheta}$

$\frac{\sin\vartheta}{1+\cos\vartheta} = \frac{\sin\vartheta}{1+\cos\vartheta}$

26. $1+\frac{\cos\vartheta}{\sin\vartheta} - 1 + \frac{\sin\vartheta}{\cos\vartheta} = \sec\vartheta\csc\vartheta$

$\frac{\cos^2\vartheta + \sin^2\vartheta}{\sin\vartheta\cos\vartheta} = \sec\vartheta\csc\vartheta$

$\frac{1}{\sin\vartheta\cos\vartheta} = \sec\vartheta\csc\vartheta$

$\sec\vartheta\csc\vartheta = \sec\vartheta\csc\vartheta$

Precalc Review 6.1-6.4

Name:_____

Show work on a separate paper!

Find the exact value of each expression.

1. $\cos^{-1}-\frac{\sqrt{3}}{2}$
2. $\tan^{-1}1$
3. $\sin^{-1}\frac{\sqrt{2}}{2}$
4. $\cos^{-1}0$
5. $\csc^{-1}\frac{2\sqrt{3}}{3}$
6. $\cot^{-1}\frac{-\sqrt{3}}{3}$
7. $\cos\left[\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)\right]$
8. $\sin^{-1}\left(\cos\frac{3\pi}{4}\right)$
9. $\sec\left(\sin^{-1}\frac{2\sqrt{5}}{5}\right)$

Use a calculator to find the value of each expression rounded to two decimal places.

10. $\csc^{-1}-5$
11. $\cot^{-1}\frac{-3}{2}$
12. $\sec^{-1}4$

Find the exact value of each trigonometric function.

13. $\tan 195°$
14. $\sin 105°$
15. $\tan\frac{19\pi}{12}$
16. $\cos\left(\frac{5\pi}{12}\right)$
17. $\sin 195°$
18. $\cos 40°\cos 10° + \sin 40°\sin 10°$

Find the exact value of each of the following under the given conditions.

a.) $\sin(\alpha+\beta)$ b.) $\cos(\alpha+\beta)$ c.) $\tan(\alpha+\beta)$

19. $\cos\alpha=\frac{\sqrt{5}}{5}, 0<\alpha<\frac{\pi}{2}$; $\sin\beta=\frac{-4}{5}, \frac{-\pi}{2}<\beta<0$

20. Find the exact value of each expression.

a.) $\sin(cos^{-1}\frac{5}{13}-cos^{-1}\frac{4}{5})$ b.) $\cos(tan^{-1}(-1)+cos^{-1}(\frac{-4}{5}))$

Establish each identity.

21. $csc\theta-sin\theta=cos\theta cot\theta$
22. $\cos\left(\frac{\pi}{2}+\vartheta\right)=-\sin\vartheta$
23. $\sin(\alpha-\beta)\sin(\alpha+\beta)=\sin^2\alpha-\sin^2\beta$
24. $(\csc\vartheta+\cot\vartheta)(\csc\vartheta-\cot\vartheta)=1$
25. $\csc\vartheta-\cot\vartheta=\frac{\sin\vartheta}{1+\cos\vartheta}$
26. $\frac{\sin\vartheta+\cos\vartheta}{\sin\vartheta}-\frac{\cos\vartheta-\sin\vartheta}{\cos\vartheta}=\sec\vartheta\csc\vartheta$