

### Spiral Test Review: Chapter 7.1-7.6

ALL PROBLEMS MUST BE DONE ON SEPARATE PAPER OTHERWISE; THE REVIEW WILL NOT BE GRADED. SHOW ALL WORK FOR CREDIT. REVIEW IS DUE ON TEST DAY.

Find the exact value of the expression.

1)  $\sin^{-1} 0$                       2)  $\cos^{-1} \frac{\sqrt{3}}{2}$                       3)  $\tan^{-1} 1$

Find the exact value of the expression. Do not use a calculator.

4)  $\cos^{-1}(\cos \pi)$               5)  $\cos^{-1}\left(\cos \frac{7\pi}{6}\right)$               6)  $\tan^{-1}\left(\tan\left(-\frac{\pi}{6}\right)\right)$               7)  $\sin^{-1}\left(\sin \frac{5\pi}{4}\right)$

Find the exact value, if any, of the composite function. If there is no value, say it is "not defined". Do not use a calculator.

8)  $\cos\left[\cos^{-1}\left(-\frac{8}{11}\right)\right]$

Find the exact value of the expression. Do not use a calculator.

9)  $\sin^{-1}\left(\sin \frac{7\pi}{6}\right)$                       10)  $\sin^{-1}\left[\sin\left(-\frac{7}{10}\right)\right]$

Find the exact value of the expression.

11)  $\sin\left[\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)\right]$                       12)  $\sin\left[\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)\right]$   
13)  $\cos^{-1}\left[\cos\left(-\frac{5\pi}{4}\right)\right]$                       14)  $\cos^{-1}\left[\sin\left(-\frac{\pi}{6}\right)\right]$

Write the trigonometric expression as an algebraic expression in u.

15)  $\cos(\tan^{-1} u)$                       16)  $\tan(\sin^{-1} u)$

Solve the equation on the interval  $0 \leq \theta < 2\pi$ .

17)  $1 - \sin \theta = \frac{1}{2}$                       18)  $4 \sin^2 \theta = 1$                       19)  $2 \cos \theta + 2\sqrt{3} = \sqrt{3}$   
20)  $2 \sin^2 \theta - 3 \sin \theta - 2 = 0$                       21)  $\sin^2 \theta + \sin \theta = 0$                       22)  $\sin^2 \theta - \cos^2 \theta = 0$

Establish the identity.

23)  $\tan \theta \cdot \csc \theta = \sec \theta$                       24)  $\tan u(\csc u - \sin u) = \cos u$   
25)  $\cot^2 x = (\csc x - 1)(\csc x + 1)$                       26)  $\csc u - \sin u = \cos u \cot u$                       27)  $\frac{1 - \sin t}{\cos t} = \frac{\cos t}{1 + \sin t}$

Find the exact value of the expression.

28)  $\sin 15^\circ$                       29)  $\sin \frac{11\pi}{12}$   
30)  $\cos \frac{5\pi}{18} \cos \frac{2\pi}{9} - \sin \frac{5\pi}{18} \sin \frac{2\pi}{9}$                       31)  $\frac{\tan 65^\circ + \tan 85^\circ}{1 - \tan 65^\circ \tan 85^\circ}$

Find the exact value under the given conditions.

32)  $\sin \alpha = \frac{4}{5}$ ,  $\frac{\pi}{2} < \alpha < \pi$ ;  $\cos \beta = \frac{2}{5}$ ,  $0 < \beta < \frac{\pi}{2}$                       Find  $\cos(\alpha - \beta)$ .  
33)  $\sin \alpha = \frac{20}{29}$ ,  $\frac{\pi}{2} < \alpha < \pi$ ;  $\cos \beta = \frac{24}{25}$ ,  $0 < \beta < \frac{\pi}{2}$                       Find  $\sin(\alpha - \beta)$ .

Use the information given about the angle  $\theta$ ,  $0 \leq \theta \leq 2\pi$ , to find the exact value of the indicated trigonometric function.

34)  $\cos \theta = \frac{12}{13}$ ,  $\frac{3\pi}{2} < \theta < 2\pi$                       Find  $\sin(2\theta)$ .                      35)  $\sin \theta = -\frac{4}{5}$ ,  $\frac{3\pi}{2} < \theta < 2\pi$                       Find  $\cos(2\theta)$ .  
36)  $\tan \theta = 3$ ,  $\pi < \theta < \frac{3\pi}{2}$                       Find  $\tan \frac{\theta}{2}$ .                      37)  $\sin \theta = \frac{1}{4}$ ,  $\tan \theta > 0$                       Find  $\cos \frac{\theta}{2}$ .

Use the Half-angle Formulas to find the exact value of the trigonometric function.

38)  $\cos 22.5^\circ$

Find the value of the expression.

39)  $\sin\left[2\cos^{-1}\left(-\frac{3}{5}\right)\right]$