

Math 142 Fall 2009 Practice Exam 2 Answers

1.  $\frac{\sqrt{2}}{2}$
2.  $\frac{\sqrt{55}}{5}$
3.  $\frac{1}{3}$
4. Any one of these (which are all equal) is correct:  $-\frac{\sqrt{2-\sqrt{3}}}{\sqrt{2+\sqrt{3}}}, \frac{1-\sqrt{3}}{1+\sqrt{3}}, -\frac{1}{2+\sqrt{3}}, -2+\sqrt{3}$
5.  $\theta = \frac{3\pi}{4} + 2k\pi, \frac{7\pi}{4} + 2k\pi$ , where  $k$  is any integer
6. NO
7.  $\frac{3\pi}{4}$
8.  $\frac{\pi}{6}$
9.  $-\cos \theta$
10.  $\frac{4\sqrt{2}}{9}$
11. Use:  $\tan(\theta + \frac{\pi}{4}) = \frac{\tan \theta + \tan \frac{\pi}{4}}{1 - \tan \theta \tan \frac{\pi}{4}}$ , then use  $\tan \theta = \frac{\sin \theta}{\cos \theta}$ ,  $\tan \frac{\pi}{4} = 1$  and simplify.
12.  $\theta = \frac{\pi}{2} + 2k\pi, \pi + 2k\pi$ , where  $k$  is any integer
13.  $x = \frac{\pi}{60} + \frac{2k\pi}{3}, \frac{11\pi}{60} + \frac{2k\pi}{3}$ , where  $k$  is any integer.
14. Use the sum and difference formula for  $\sin 3\theta = \sin(2\theta + \theta)$ , then use the double angle formulas for  $\sin 2\theta$  and  $\cos 2\theta$ .
15. (a)  $C = 65^\circ, a = 8.6, c = 11.4$   
(b) no triangle  
(c)  $c = 5.8, A = 48.4^\circ, B = 85.6^\circ$