MATH 142
EXAM 2 REVIEW – CHAPTERS 3–4

1. (3.1) Consider the angle $\theta = 210°$.

(a) What is $\hat{\theta}$, the reference angle?

(b) Evaluate $\sin\theta$

(c) Evaluate $\sec\theta$

2. (3.1) Use a calculator to find θ to the nearest tenth of a degree if $\csc\theta = -1.4325$ and θ is in QIII.

3. (3.2) Use a calculator to convert 2.5 radians to degrees. Round your answer to the nearest tenth of a degree.

4. (3.2) Evaluate $4\cos(2x + \pi)$ when $x = \dfrac{\pi}{6}$.

5. (3.3) From memory, complete QIII of the unit circle. Include the negative x-axis, the negative y-axis, all ordered pairs and each angle in degrees and radians (there will be 5 angles total).

6. (3.3) Find all values for which $\cot\theta = -\dfrac{\sqrt{3}}{3}$ for $0 \le \theta \le 2\pi$.

7. (3.4) How far does the tip of an 8-inch long pendulum on a clock travel if it swings 25°?

8. (3.4) A large pizza from Giovanni's measures 18 inches in diameter and is cut into 9 equal slices.

(a) What is the central angle at the tip of each slice (in degrees)?

(b) What is the area of one slice?

(c) If Mark wanted each slice to have an area of $\frac{27\pi}{4}$ in^2, how many equal slices will there be in a large pizza?

9. (4.1) Sketch the graph of $y = \tan x$ for $-\dfrac{\pi}{2} \le x \le \dfrac{3\pi}{2}$

10. (4.1) Prove the following identity:

$$\cos(-\theta)\csc(-\theta)\tan(-\theta) = 1$$

11. (4.2) Graph one complete cycle of

$$y = -\frac{1}{2}\cos(\pi x)$$

12. (4.3) Consider the graph of

$$f(x) = 1 - 2\sin\left(\frac{x}{2} + \frac{\pi}{3}\right)$$

Determine each of the following:

(a) Amplitude

(b) Period

(c) Phase shift

(d) Vertical translation

(e) Range

13. (4.3) Graph one cycle of (from #12)

$$f(x) = 1 - 2\sin\left(\frac{x}{2} + \frac{\pi}{3}\right)$$

14. (4.4) Graph one cycle of

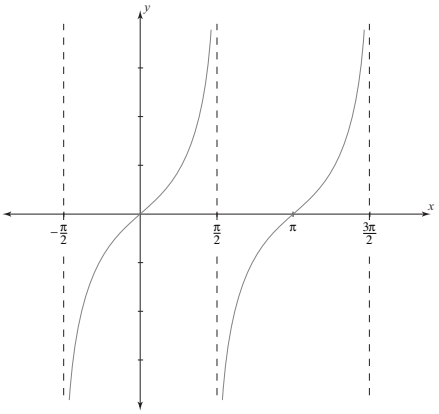
$$y = 2\csc\left(x - \frac{\pi}{4}\right)$$

15. (4.7) Evaluate: $\sin^{-1}\left(-\dfrac{1}{2}\right)$

16. (4.7) Simplify: $\cos^{-1}(\sin 240°)$

17. (4.7) Simplify: $\cot\left(\sin^{-1}\dfrac{x}{5}\right)$

1. (a) $30°$; (b) $-\frac{1}{2}$; (b) $-\frac{2\sqrt{3}}{3}$
2. $224.3°$
3. $143.2°$
4. -2
5. Moving counter clockwise:
   $(-1, 0), 180°, \pi$
   $\left(-\sqrt{3}/2, -1/2\right), 210°, 7\pi/6$
   $\left(-\sqrt{2}/2, -\sqrt{2}/2\right), 225°, 5\pi/4$
   $\left(-1/2, -\sqrt{3}/2\right), 240°, 4\pi/3$
   $(0, -1), 270°, 3\pi/2$
6. $\frac{2\pi}{3}, \frac{5\pi}{3}$
7. $\frac{10\pi}{9}$ inches
8. (a) $40°$; (b) 9π in^2; (c) 12 slices
9. graph:

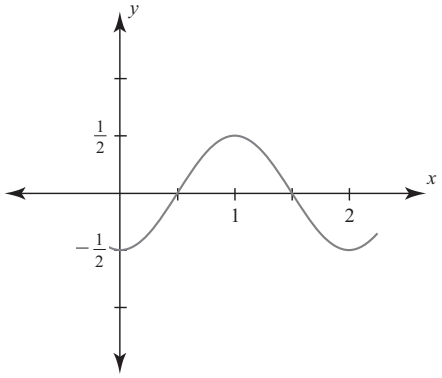


10. $\cos(-\theta)\csc(-\theta)\tan(-\theta) =$

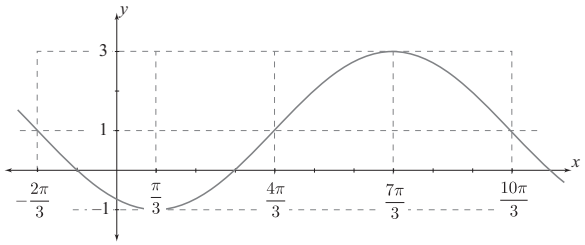
$$\cos(-\theta)\frac{1}{\sin(-\theta)}\frac{\sin(-\theta)}{\cos(-\theta)} =$$

$$\cos(\theta)\frac{1}{-\sin\theta}\frac{-\sin\theta}{\cos\theta} = 1$$

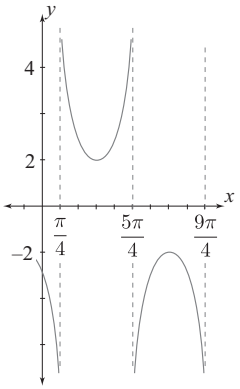
11. graph:



12. (a) 2; (b) 4π; (c) $\frac{2\pi}{3}$ units to the left; (d) one unit up; (e) $[-1, 3]$
13. graph:



14. graph:



15. $-\frac{\pi}{6}$
16. $150°$
17. $\frac{\sqrt{25 - x^2}}{x}$