

**Exam #2**

February 14, 2018

Name \_\_\_\_\_

- You will be told when to begin the work and when to terminate work on the examination. You must stop when instructed. Points may be deducted in case of violations.
- Please show your work to support your answers that require calculations. Correct but unsupported answers may not be given full credit.
- The use of a cell phone or other electronic communication devices during the examination is not allowed. The exam will be canceled and a grade of “0” will be assigned to anyone who uses a cell phone during the examination or if one is found within hands reach.
- Calculators are not allowed on this exam.
- The exam consist of three parts. Part I contains six multiple choice questions worth 5 points each. Part II contains four open ended questions. Part III contains two conceptual questions.

## Part I

Choose your answer from available choices. No partial credit will be given for wrong answers.

1. Find the exact value of  $\sin(600^\circ)$

- (a)  $\frac{1}{2}$       (b)  $-\frac{1}{2}$       (c)  $\frac{\sqrt{3}}{2}$       (d)  $-\frac{\sqrt{3}}{2}$       (e) None of the above

2. Find the exact value of  $\tan(225^\circ)$

- (a)  $\sqrt{3}$       (b)  $-\sqrt{3}$       (c)  $\frac{\sqrt{3}}{3}$       (d)  $-\frac{\sqrt{3}}{3}$       (e) None of the above

3. Find the exact value of  $\cos(\frac{7\pi}{6})$

- (a)  $\frac{1}{2}$       (b)  $-\frac{1}{2}$       (c)  $\frac{\sqrt{3}}{2}$       (d)  $-\frac{\sqrt{3}}{2}$       (e) None of the above

4. Find the exact value of  $\sin^{-1}(-\frac{1}{2})$

- (a)  $\frac{\pi}{6}$       (b)  $\frac{5\pi}{3}$       (c)  $\frac{7\pi}{6}$       (d)  $-\frac{\pi}{6}$       (e) None of the above

5. Find the exact value of  $\cos^{-1}(-\frac{\sqrt{3}}{2})$

- (a)  $\frac{\pi}{6}$       (b)  $\frac{5\pi}{3}$       (c)  $\frac{7\pi}{6}$       (d)  $-\frac{\pi}{6}$       (e) None of the above

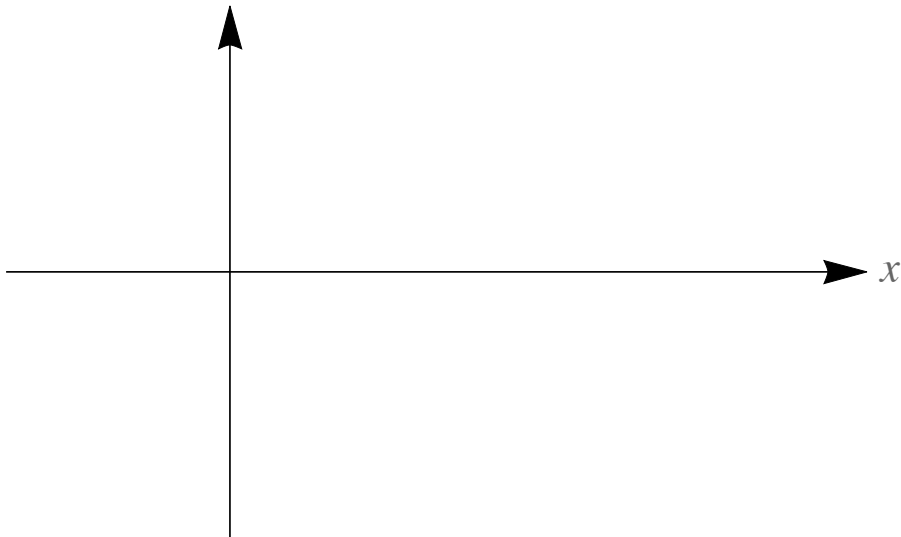
6. Find the exact value of  $\cos^{-1}(-2)$

- (a)  $\frac{\pi}{6}$       (b)  $\frac{5\pi}{3}$       (c)  $\frac{7\pi}{6}$       (d)  $-\frac{\pi}{6}$       (e) None of the above

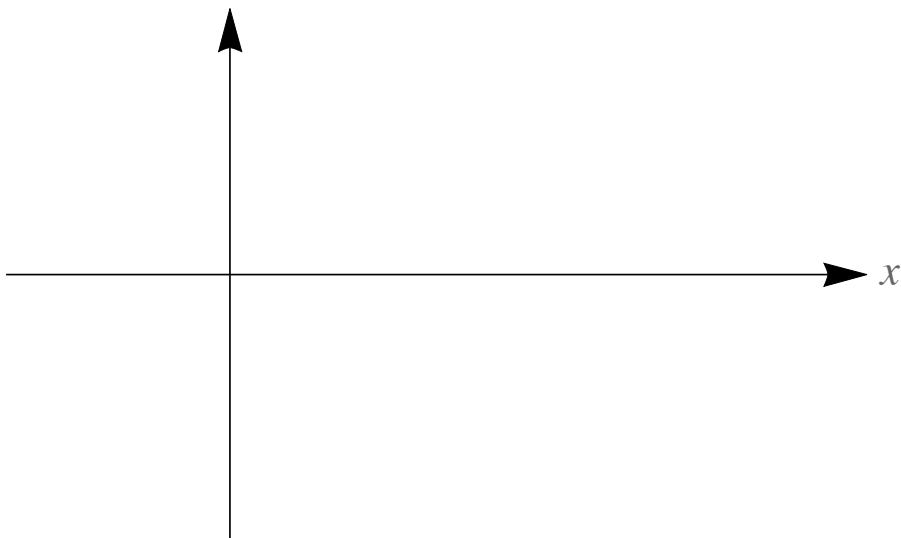
## Part II

7. (a) (15 pts) Find the period, amplitude, phase shift and plot the following function using the five key points

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

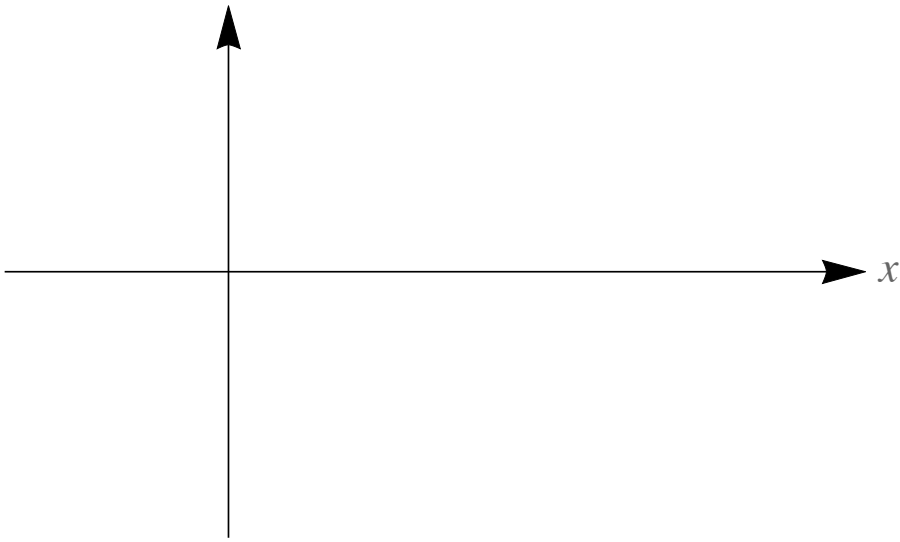


- (b) (5 pts) Use the part (a) to graph  $-3 \csc\left(\frac{\pi}{2}x + \pi\right)$



8. (15 pts) Graph the function below

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



9. (5 pts each) Find the exact value of the following. [Show your work for full credit]

(a)  $4 \cos(34^\circ) \csc(56^\circ) + 2 \sin(-67^\circ) \sec(23^\circ)$

(b)  $2 + \frac{\sin(41^\circ)}{\csc(41^\circ)} + \cos(41^\circ) \sin(49^\circ)$

10. (5 pts each) Evaluate the expression below. [Show your work for full credit]

(a)  $\sin^{-1} \left( \sin \left( \frac{7\pi}{6} \right) \right)$

(b)  $\sin \left( \sin^{-1} \left( -\frac{1}{3} \right) \right)$

(c)  $\cos \left( \tan^{-1} \left( -\sqrt{3} \right) \right)$

### Part III

11. (10 pts) **Why** does  $y = \tan(x)$  and  $y = \sec(x)$  have the same vertical asymptotes?

12. (10 pts)

(a) **Why** do we restrict the domain of trigonometric functions to define the inverse trigonometric functions?

(b) **Why** is the restricted domain of cosine  $[0, \pi]$  and not  $[-\pi/2, \pi/2]$ ?