

Name: _____

Section: _____

Zid: _____

Directions: Complete the information above then, on the answer sheet, fill in the following in the appropriate spaces and darken the corresponding ovals:

1. Last name, first and middle initials.
2. Student Z Number. (LEFT-justify the 6 digits in the ID field leaving the last 3 spaces blank.)
3. Section:

A1=11

B1=21

C1=31

D1=41

A2=12

B2=22

C2=32

D2=42

A3=13

B3=23

C3=33

D3=43

4. Your signature on the back.
5. No Scratch paper outside of the Exam is permitted.
6. Only a basic **non-text capable, non-graphing** calculator is permitted.
7. **Graphing calculators, cell phones and pdas shall be stowed out of sight.
IF VISIBLE YOU WILL BE DEEMED TO BE CHEATING AND WILL RECEIVE
A ZERO SCORE FOR THE EXAM!!!**
8. Check that your exam contains exactly 20 problems. Each problem is worth 5 points.

[1A] The population of a midwestern city follows the exponential law. If the population increased from 1,000 to 3,000 from 2000 to 2003, what will the population be in 2009?

(a) 6,000

(d) 27,000

(b) 12,000

(e) None of the above

(c) 9,000

[2A] Simplify $\left(\frac{1 - \sin \theta}{1 + \sin \theta}\right) \left(\frac{1 + \csc \theta}{1 - \csc \theta}\right)$

- (a) -1 (d) $\cos \theta + \sin \theta$
(b) 1 (e) None of the above.
(c) 0

[3A] Simplify $\frac{1}{\sec x} \left(\frac{1}{\cos x} - \cos x\right)$

- (a) $\cos^2 x$ (d) $-\sin^2 x$
(b) $-\cos^2 x$ (e) None of the above.
(c) $\sin^2 x$

[4A] Which of the following are identities?

- (I) $\cos^2 t - \sin^2 t = 1 + 2 \sin^2 t$
(II) $\tan \beta \sin \beta = \sec \beta - \cos \beta$
(III) $\csc \theta \cos \theta \tan \theta = 1$
- (a) I, II, III (d) III only
(b) I only (e) Some other selection.
(c) II only

[5A] Suppose that $\triangle ABC$ is a right triangle with $\angle C = \frac{\pi}{2}$. If $AC = 9$ and $BC = 12$ then:

- (a) $\cos A = \frac{4}{5}$ & $\sin A = \frac{3}{5}$ & $\tan A = \frac{3}{4}$ (d) $\cos A = \frac{3}{5}$ & $\sin A = \frac{4}{5}$ & $\tan A = \frac{3}{4}$
(b) $\cos A = \frac{4}{5}$ & $\sin A = \frac{3}{5}$ & $\tan A = \frac{4}{3}$ (e) None of the above are true.
(c) $\cos A = \frac{3}{5}$ & $\sin A = \frac{4}{5}$ & $\tan A = \frac{4}{3}$

[6A] $810^\circ =$

- (a) $\frac{5\pi}{2}$ (d) $\frac{\pi}{2}$
(b) $\frac{7\pi}{2}$ (e) None of the above.
(c) $\frac{9\pi}{2}$

[7A] Two angles of a triangle are $\frac{\pi}{7}$ and $\frac{2\pi}{9}$.

What is the third angle?

- (a) $\frac{47\pi}{63}$ (d) $\frac{38\pi}{63}$
(b) $\frac{31\pi}{63}$ (e) None of the above.
(c) $\frac{40\pi}{63}$

[8A] Find the area of the sector of radius 4 in. and central angle 3° .

[$A = \frac{1}{2}\theta r^2$ when the angle is in **radians**.]

- (a) 18 in^2 . (d) $\frac{\pi}{10} \text{ in}^2$.
(b) 24 in^2 . (e) None of the above.
(c) $\frac{2\pi}{15} \text{ in}^2$.

[9A] If $\sin t = -.456$ and $\cos x = -.345$ then

- (a) $\sin(-t) = -.456$ & $\cos(-x) = .345$ (d) $\sin(-t) = .456$ & $\cos(-x) = .345$
(b) $\sin(-t) = -.456$ & $\cos(-x) = -.345$ (e) None of the above.
(c) $\sin(-t) = .456$ & $\cos(-x) = -.345$

[10A] Evaluate $\sin\left(\frac{19\pi}{4}\right)$

(a) $\frac{1}{2}$ (c) $\frac{\sqrt{2}}{2}$ (e) $\frac{\sqrt{3}}{2}$

(b) $-\frac{1}{2}$ (d) $-\frac{\sqrt{2}}{2}$

[11A] Evaluate $\cos\left(\frac{19\pi}{4}\right)$

(a) $\frac{1}{2}$ (c) $\frac{\sqrt{2}}{2}$ (e) $\frac{\sqrt{3}}{2}$

(b) $-\frac{1}{2}$ (d) $-\frac{\sqrt{2}}{2}$

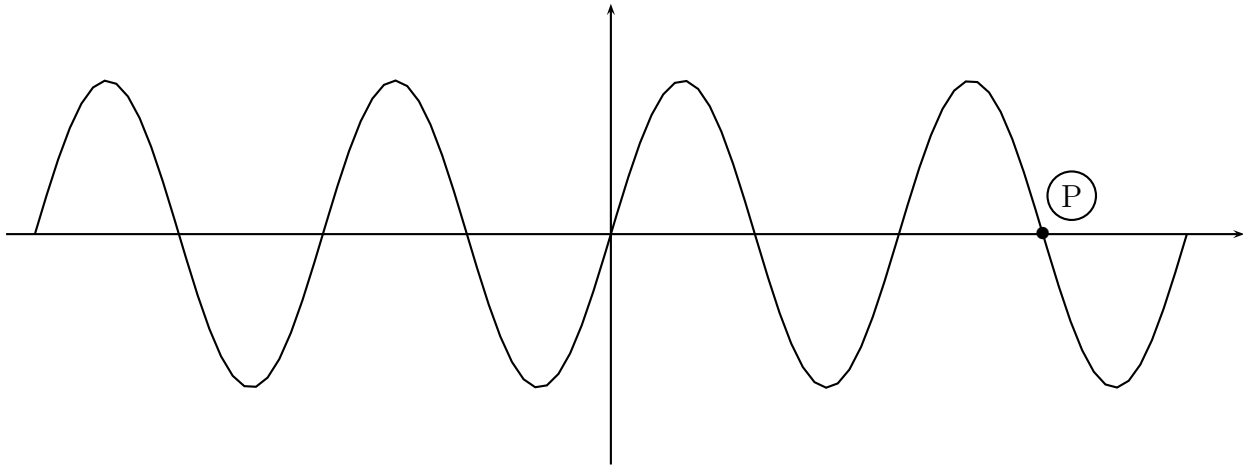
[12A] Evaluate $\tan\left(\frac{19\pi}{4}\right)$

(a) -1 (c) $\sqrt{2}$ (e) None of the above.

(b) 1 (d) $\sqrt{3}$

[13A] In the following graph of $y = \sin(x)$ the point P has coordinates:

- (a) $(\frac{3\pi}{2}, 0)$ (c) $(\frac{5\pi}{2}, 0)$ (e) None of the above.
(b) $(-\frac{3\pi}{2}, 0)$ (d) $(\frac{7\pi}{2}, 0)$



[14A] Simplify $\frac{\tan^2 \beta}{\sec \beta - 1} - \frac{\tan^2 \beta}{\sec \beta + 1}$

- (a) -2 (d) $2 \sin^2 \beta$
(b) 2 (e) None of the above.
(c) $2 \cos^2 \beta$

[15A] When an analog clock reads 2:00, what is the larger angle, in radians, between the hour hand and the minute hand?

- (a) $\frac{4\pi}{3}$ (c) $\frac{7\pi}{6}$ (e) None of the above.
(b) $\frac{5\pi}{3}$ (d) $\frac{11\pi}{6}$

[16A] Evaluate: $\sin\left(\frac{\pi}{2}\right) + 2\sin\left(\frac{\pi}{3}\right) + 3\cos\left(\frac{\pi}{6}\right) + 4\cos\left(\frac{\pi}{4}\right)$

(a) $\frac{5}{2} + 2\sqrt{2}$

(d) $1 + 2\sqrt{2} + \frac{5\sqrt{3}}{2}$

(b) $\frac{7}{2} + 2\sqrt{2}$

(e) None of the above.

(c) $2\sqrt{2} + \frac{5\sqrt{3}}{2}$

[17A] In the following graph of $y = \cos(x)$ the point Q has coordinates:

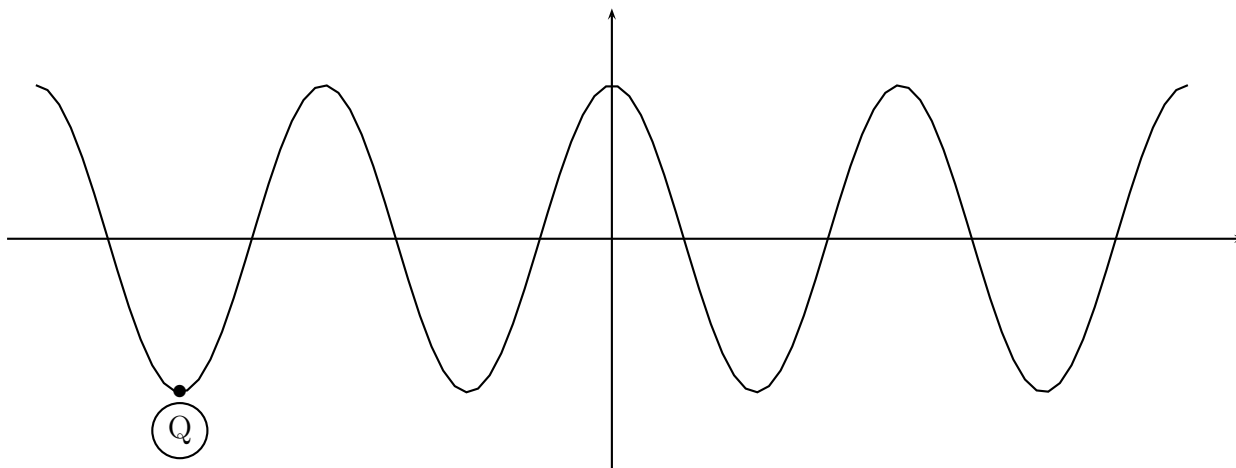
(a) $\left(-\frac{3\pi}{2}, -1\right)$

(c) $(-3\pi, -1)$

(e) None of the above.

(b) $\left(-\frac{5\pi}{2}, -1\right)$

(d) $(-6\pi, -1)$



[18A] A wheel of radius 6 feet is rotating at 50 rpm (revolutions per minute). What is the angular speed in radians per minute?

(a) 100π radians/min

(c) 400π radians/min

(e) None of the above.

(b) 600π radians/min

(d) 100 radians/min

[19A] A wheel of radius 6 feet is rotating at 50 rpm (revolutions per minute). What is the linear speed in feet per minute of a point on the circumference of the wheel?

- (a) 100π ft/min (c) 400π ft/min (e) None of the above.
 (b) 600π ft/min (d) 100 ft/min

[20A] Which is the graph of $y = -\cos x$?

