MATH 155 **EXAM 2 -SAMPLE**

No Scratch paper outside of the Exam book is permitted!

Directions: 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, A3=13	C1=31, C2=32	E1=51, D2=52
B1=21, B2=22	D1=41, D2=42	G1=71, G2=72

4. Your signature on the back.

Problems: Check that your exam contains exactly 20 problems. Each problem is worth 5 points. Circle the answer on the exam and darken the corresponding oval on the answer sheet.

[1] The population of a midwestern city follows the exponential law. If the population decreased from 1,000,000 to 800,000 from 1995 to 1998, what will the population be in 2001?

(a) 640,000 (d) 400,000

(b) 600,000 (e) None of the above

(c) 480,000

[2] Simplify $\left(\dfrac{\cot(2\theta)-1}{\cot(2\theta)+1}\right)\left(\dfrac{1+\tan(2\theta)}{1-\tan(2\theta)}\right)$

(a) 1 (d) $\tan\theta$

(b) $\cos\theta$ (e) 0

(c) $\sin\theta$

[3] Simplify $(\tan x)\left(\dfrac{1}{\sin x} - \sin x\right)$

(a) $\cos x$

(b) 1

(c) 0

(d) $\sin x$

(e) $\tan x$

[4] Which of the following are NOT 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

(b) I only

(c) II only

(d) III only

(e) Some other selection

[5] Suppose that $\triangle ABC$ is a right triangle with $\angle C = \dfrac{\pi}{2}$. If $AC = 6$ and $BC = 8$ then:

(a) $\sin A = \dfrac{4}{5}$ & $\cos A = \dfrac{3}{5}$ & $\tan A = \dfrac{3}{4}$

(b) $\sin A = \dfrac{4}{5}$ & $\cos A = \dfrac{3}{5}$ & $\tan A = \dfrac{4}{3}$

(c) $\sin A = \dfrac{3}{4}$ & $\cos A = \dfrac{4}{3}$ & $\tan A = \dfrac{4}{5}$

(d) $\sin A = \dfrac{3}{5}$ & $\cos A = \dfrac{4}{5}$ & $\tan A = \dfrac{3}{4}$

(e) None of the above are true

[6] $450^\circ =$

(a) $\frac{\pi}{3}$

(b) $\frac{5\pi}{2}$

(c) $\frac{2\pi}{5}$

(d) 5π

(e) Some other value.

[7] Two angles of a triangle are $\frac{\pi}{3}$ and $\frac{2\pi}{5}$. What is the third angle?

(a) $\frac{4\pi}{15}$

(b) $\frac{\pi}{2}$

(c) $\frac{2\pi}{5}$

(d) $\frac{7\pi}{5}$

(e) Some other value.

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

(a) $18in^2$.

(b) $6in^2$.

(c) $6\pi in^2$.

(d) $18\pi in^2$.

(e) $\frac{18}{\pi}in^2$.

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

(a) $\sin(-t) = -.456$ & $\cos(-x) = .345$

(b) $\sin(-t) = -.456$ & $\cos(-x) = -.345$

(c) $\sin(-t) = .456$ & $\cos(-x) = -.345$

(d) $\sin(-t) = .456$ & $\cos(-x) = .345$

(e) $\sin(-t) = 0$ & $\cos(-x) = 1$

[10] Evaluate $\sin\left(\frac{183\pi}{4}\right)$

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

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

[11] Evaluate $\cos\left(\frac{183\pi}{4}\right)$

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

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

[12] Evaluate $\tan\left(\frac{183\pi}{4}\right)$

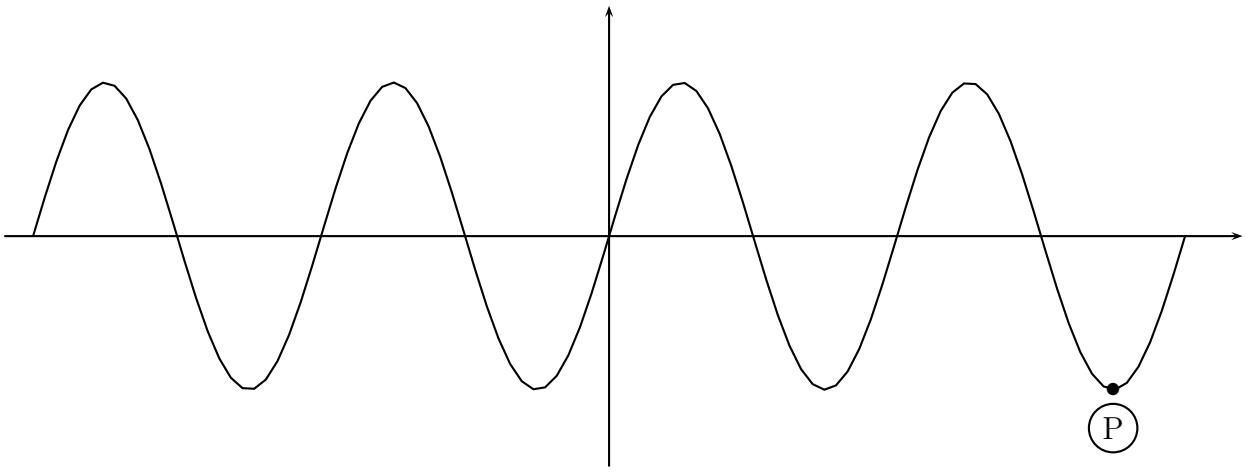
(a) 1 (c) $\sqrt{3}$ (e) None of the above

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

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

(a) $(\frac{\pi}{2}, -2)$ (c) $(\frac{5\pi}{2}, -1)$ (e) $(7\pi, -1)$

(b) $(\frac{\pi}{2}, -1)$ (d) $(\frac{7\pi}{2}, -1)$



[14] Simplify $\dfrac{\sin^2\beta}{1-\cos\beta} + \dfrac{\sin^2\beta}{1+\cos\beta}$

(a) 2 (d) $2\sin\beta\cos\beta$

(b) $2\cos^2\beta$ (e) $2\tan^2\beta$

(c) $2\cos^2\beta$

[15] When an analog clock reads 5:00, what is the smaller angle, in radians, between the hour hand and the minute hand?

(a) $\dfrac{\pi}{2}$ (d) $\dfrac{\pi}{12}$

(b) $\dfrac{5\pi}{6}$ (e) None of the above

(c) $\dfrac{7\pi}{6}$

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

(a) $\frac{2}{3} + \sqrt{2}$

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

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

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

(e) None of the above

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

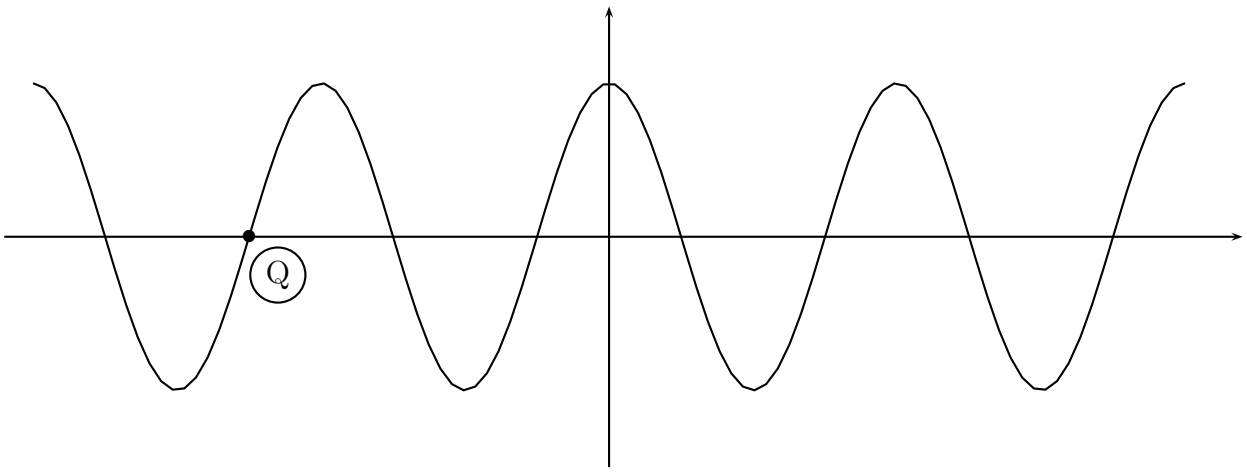
(a) $(-\frac{\pi}{2}, 0)$

(b) $(-\frac{\pi}{2}, 0)$

(c) $(-\frac{5\pi}{2}, 0)$

(d) $(-\frac{7\pi}{2}, 0)$

(e) $(-3\pi, 0)$



[18] A wheel of radius 3 feet is rotating at 100 rpm (revolutions per minute). What is the angular speed in radians per minute?

(a) 200π radians/min

(b) 600π radians/min

(c) 900π radians/min

(d) 600 radians/min

(e) None of the above

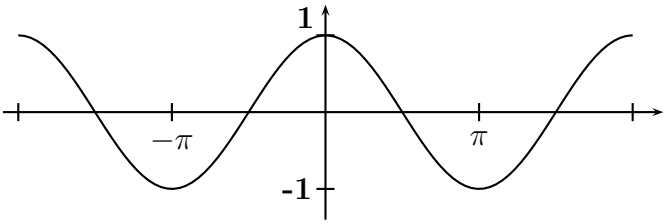
[19] A wheel of radius 3 feet is rotating at 100 rpm (revolutions per minute). What is the linear speed in feet per minute of a point on the circumference of the wheel?

(a) 200π ft/min (c) 900 ft/min (e) None of the above

(b) 600 ft/min (d) 200 ft/min

[20] Which is the graph of $y = cosx$?

(a)



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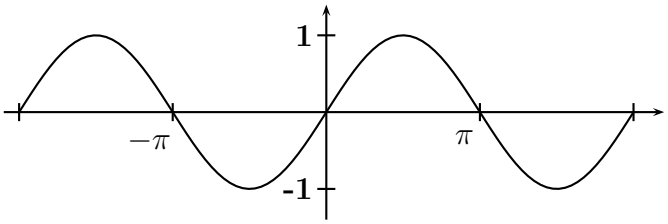
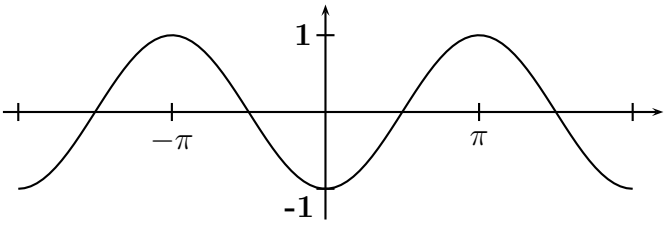
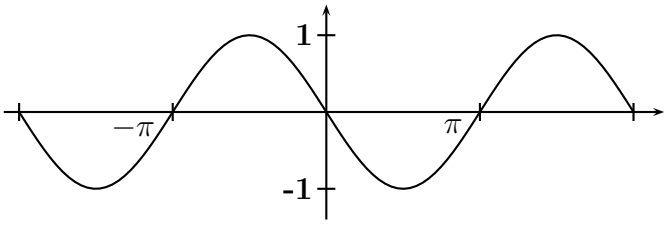


(c)



(d)



(e)