Math 2012 Quiz 1 Practice Spring 2008

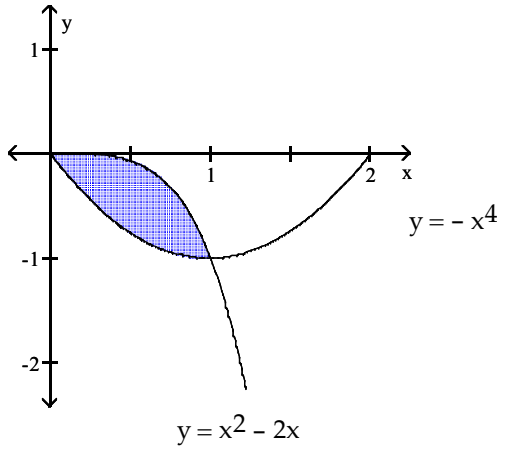
Name: Last _____, First _____

You must show all work to get credit for you problems. NO work or explanations – no credit.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

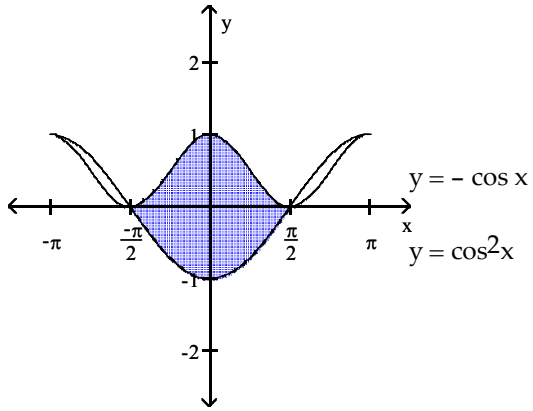
Find the area of the shaded region.

1) 1) _____



A) $\frac{76}{15}$ B) $\frac{7}{15}$ C) 2 D) $\frac{22}{15}$

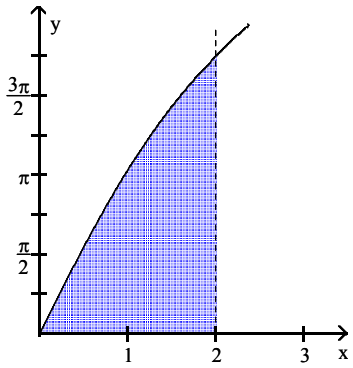
2) 2) _____



A) $2 - \frac{\pi}{2}$ B) 2 C) $2 + \frac{\pi}{2}$ D) $2 + \pi$

Find the volume of the solid generated by revolving the shaded region about the given axis.

3) About the y–axis 3) _____



$x = 2\tan\left(\frac{y}{7}\right)$

A) $7\pi^2 - 14\pi$ B) 28π C) $14\pi^2 + 7\pi$ D) $14\pi^2 - 28\pi$

Solve the problem.

4) Find the volume of the solid of revolution with the region between $y = \frac{5}{\sqrt{4 + x^2}}$ and the x–axis from $x = -2$ to $x = 2$. 4) _____

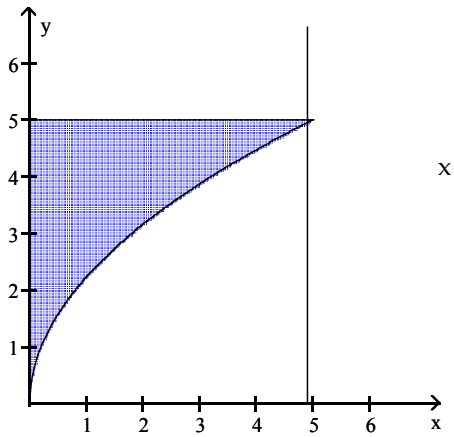
A) $25\pi^2$ B) $\frac{5}{4}\pi^2$ C) 25π D) $\frac{25}{4}\pi^2$

5) Find the volume that remains after a hole of radius 1 is bored through the center of a solid cylinder of radius 4 and height 8. 5) _____

A) 120π B) 8π C) 128π D) 60π

Use the shell method to find the volume of the solid generated by revolving the shaded region about the indicated axis

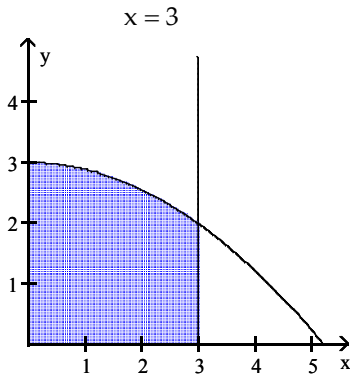
6) About the x–axis 6) _____



$x = y^2/5$

A) $\frac{125}{3}\pi$ B) 50π C) $\frac{125}{4}\pi$ D) $\frac{125}{2}\pi$

7) About the y–axis 7) _____



$y = 3 - x^2/9$

A) $\frac{45}{2}\pi$ B) 18π C) 27π D) $\frac{45}{4}\pi$

Set up an integral for the length of the curve.

8) $x = y^2 + 2y, 0 \le y \le 2$ 8) _____

A) $\int_0^2 \sqrt{2y + 3}\, dy$ B) $\int_0^2 \sqrt{4y^2 + 5}\, dy$

C) $\int_0^2 \sqrt{4y^2 + 8y + 5}\, dy$ D) $\int_0^2 \sqrt{4y^2 + 4y + 4}\, dy$

9) $y = \int_0^x \cot t\, dt, \frac{\pi}{6} \le x \le \frac{\pi}{3}$ 9) _____

A) $\int_{\pi/6}^{\pi/3} \sqrt{\csc x}\, dx$ B) $\int_{\pi/6}^{\pi/3} \csc x\, dx$

C) $\int_{\pi/6}^{\pi/3} \sqrt{1 + \cot x}\, dx$ D) $\int_{\pi/6}^{\pi/3} \sqrt{1 + \csc^4 x}\, dx$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

10) The force exerted on a small module by gravity is given by the force equation: 10) _____

$$F(x) = \frac{10{,}000{,}000}{x^2}$$

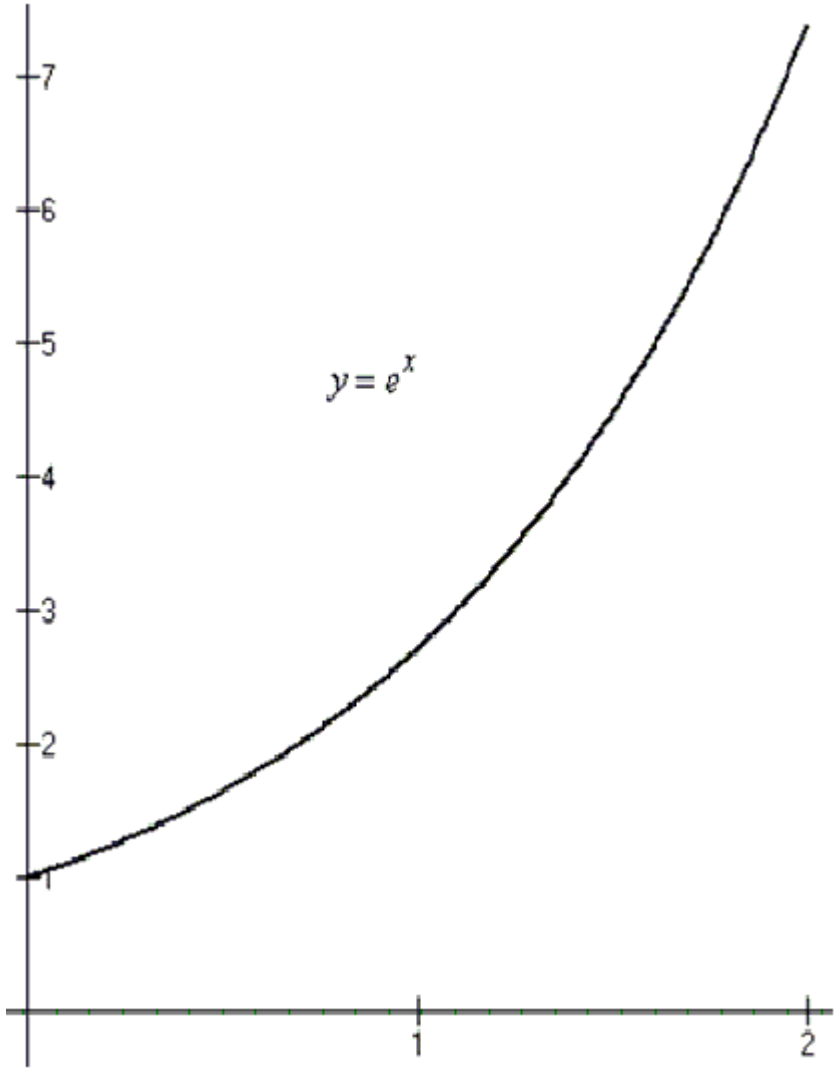
Find the work required to propel the satellite from the earth's surface (x = 4000 miles) to

a) 100 miles above the earth's surface and then

b) from 100 miles to 23,000 miles above the earth's surface and then

c) from 23,000 to 100,000,000 miles away assuming no other planets are there to attract the spacecraft. (Be sure to pack your toothbrush)

11) Find the arc length s along the curve $y = e^x$ for $0 < x < 2$. Set up the integral and then calculate the length with your calculator. 11) _____



Answer Key
Testname: MATH-2012-QUIZ1-PRACTICE-SP08

1) B
2) C
3) D
4) D
5) A
6) D
7) A
8) C
9) B
10) a) 61.0 b) 2068.7 c) 370.4
11) 6.79