

Name: _____

Section 101 (11-12):

Section 102 (12-1):

MATH 32 SPRING 2013

MIDTERM 2

Start time: 8:10am

End time: 9:00am

No books, notes, calculators, or electronic devices allowed.

Please show your work and provide explanations where appropriate.

If you need more space, you may use the backs of the pages or attach extra paper, but please make a note that you did so.

| Problem | Score | Out of |
|---------|-------|--------|
| 1 | | 10 |
| 2 | | 10 |
| 3 | | 15 |
| 4 | | 10 |
| 5 | | 15 |
| Total: | | 60 |

MATH 32 SPRING 2013 MIDTERM 2

- (1) (10 points) Suppose you put \$100 in a bank account which gives 6% interest compounded monthly. If you don't add or remove money from the account, after how many years will you have \$500 in the account?

You may express your answer in terms of a logarithm - no need to give a decimal approximation.

Recall that the formula for interest compounded n times a year is

$$A = P \left(1 + \frac{r}{n} \right)^{nt} .$$

- (2) (10 points) Simplify $\log_4(16^4) + \log_4(2^3)$.

- (3) (a) (5 points) Find the area of the ellipse given by

$$\frac{(x - 2)^2}{3} + (y - 1)^2 = 1.$$

- (b) (5 points) Find the circumference of the circle given by

$$(x - 2)^2 + (y - 1)^2 = 16.$$

- (c) (5 points) Find the area of the triangle in the plane with vertices $(2, -2)$, $(4, -2)$, and $(1, 2)$.

(4) (10 points) Find all values of x satisfying

$$\ln(x) + \ln(2x) = 2.$$

(5) Recall that by $\text{area}(x^2, 1, 2)$, I mean the area below the graph $y = x^2$ and above the x -axis, from $x = 1$ to $x = 2$.

(a) (10 points) Estimate the value of $\text{area}(x^2, 1, 2)$ by computing the area of two rectangles, each of width $\frac{1}{2}$, drawn below the graph. Draw a picture to make it clear what area you are computing.

(b) (5 points) Is the actual value of $\text{area}(x^2, 1, 2)$ larger or smaller than your answer in part (a)?