

STA103
Spring 2001

Name _____
Circle section: F 8:00, F 9:10, F 10:30, F 11:50

Diagnostic Quiz

STA103 is more math-intensive than STA101 or STA102; you need to have completed at least MTH31 or its equivalent to do well in the class. The simple problems that follow are meant to give you a sample of the kind of mathematical skills you'll need.

1. Integrate: $\int_a^b (\frac{1}{2}x + 2)dx$

2. Integrate: $\int_0^1 (\frac{4}{5}x + \frac{6}{5}y)dx$

3. Find the constant c such that $\int_0^1 cy^2dy = 1$.

4. Take the derivative of $10p^3(1-p)^2$ with respect to p .

5. Find the value of x which maximizes the function $f(x) = \frac{1}{2}(x^3 - 3x^2)$ on the interval $(-1,3)$. Show that it is the maximum (rather than the minimum).

For the questions below, circle all choices which are correct.

6. Which of the following expressions are equal to $\ln\left(\frac{1}{3\theta^2}e^{\frac{y^2}{\theta}}\right) = ?$

- (a) $-6 \ln \theta - \frac{y^2}{\theta}$
- (b) $2 \ln(3\theta) - e^{\frac{y^2}{\theta}}$
- (c) $-\ln(3\theta^2) + \frac{y^2}{\theta}$
- (d) $-\ln 3 - 2 \ln \theta + \frac{y^2}{\theta}$

7. Which of the following expressions are equal to $\prod_{x=1}^5 (2x) = ?$

- (a) 3840
- (b) 30
- (c) $2^5 5!$
- (d) $2(1 + 2 + 3 + 4 + 5)$

8. Which of the following expressions are equal to $\sum_{i=1}^n (-2x_i + 3) = ?$

- (a) $-2 \sum_{i=1}^n x_i + 3$
- (b) $-\left(\sum_{i=0}^{n-1} 2x_{i+1} - 3n\right)$
- (c) $-2 \sum_{i=1}^n x_i + 3n$
- (d) none of the above