**AP Calculus AB Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chapter 6 Test Review Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Hour\_\_\_\_\_\_\_\_\_\_\_**

**Integration by Substitution**

1.

2.

3.

4. What is the *average value* of y = x(x2 -2)1/2 on the interval [0, 4]?

**Differential Equations and Exponential Growth/Decay**

5. What is the solution to with the initial condition y(0) = 3?

6. If dy/dt = -3ky and k is a nonzero constant, then y is

**Past Material**

7. Let f be the function with derivative defined by f ‘(x) = cos(x2) on the interval 0 < x < 3.6. How many points of inflection does the graph of f have on this interval? [CALC ALLOWED]

8. What is the *average rate of change* of y = on the closed interval [-3, 1]? [CALC ALLOWED]

9. If f(x) = x2 - 3x + 4, then (f(ex)) =

**Free Response Questions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| t (hours) | 0 | 2 | 4 | 6 | 8 |
| T(t) | 60 | 63 | 68 | 75 | 73 |

**1. The temperature is modeled by an increasing, differentiable function T of time t, where t is measured in hours. The table above gives the temperature recorded every 2 hours over an 8-hour period. [CALC ALLOWED]**

a) Use the data in the table to estimate the instantaneous rate of change at t = 5. Show your work and indicate units of measure.

b) Write an integral expression in terms of T for the average temperature between t = 0 and t = 8. Estimate the average temperature using a right Riemann sum with four subintervals of equal length. Show your work and indicate units of measure.

c) Is your approximation in part (b) an underestimate or an overestimate of the average temperature? Give a reason for your answer.

d) Are the data in the table consistent with or do they contradict the claim that the temperate is increasing at an increasing rate? Give a reason for your answer.

**2. Consider the differential equation dy/dx = x – y + 1**

