Calculus BC Release Items 2015

1. The slope of the tangent line to the graph of $2x^3 + y^3 - 1 = x^2y$ at the point (2, -3) is between which of the following pairs of numbers?

a) -2, -1 b) -1, 0 c) 0, 1 d) 1, 2 e) none of these

2. If the fourth degree Taylor polynomial about x = 1 for x ln(x) is evaluated at x = 2, what is the value?
(round to the nearest hundredth)

a) 1.39 b) 1.42 c) 1.50 d) 1.75 e) None of these

3. Let R be the region bounded by the graphs of $y = x + 2$ and $y = x^2$. Which of the following intervals contains the volume of the solid generated when R is revolved about the line $x = 5$?

a) (20, 40) b) (40, 60) c) (60, 80) d) (80, 100) e) None of these

4. The graph of the function f(x) consists of two parabolas where $f(x) = x^2 + 2x + 4 \; if \; -3 \le x < -1$ and $f(x) = x^2 - 2x - 3 \; if \; -1 \le x \le 6$. If g(x) is the function defined by $g(x) = \int_{-3}^{x} f(t)\,dt$, and g(w) $= \frac{10}{3}$
Then w is between which of the following pairs of numbers. Select all that apply.

a) -3, -2 b) -1, 0.5 c) 0.5, 2 d) 2, 3.5 e) 3.5, 6

5. Rotate the region $y = 1/x$, $y = 0$, $x = 1$, $x = 3$ about the line x = 4. Find the volume created. Round to the nearest tenth.

a) 15.0 b) 3.4 c) 12.6 d) 4.0 e) none of these

6. Given the series $\sum_{1}^{\infty} \frac{3n^2 + 5n}{2^n n^2 + 2^n}$, answer the following showing all work.

a. Use the Basic Comparison Test to prove either Convergence or Divergence for the series above. You may not use the Limit Comparison Test for this part.

b. Explain why the series $\sum_{1}^{\infty} \frac{1}{2^n}$ does not work to compare with the series above for the Basic Comparison Test but does work for the Limit Comparison Test.