

Sample Questions for MATH 1270 for Exam 2, Spring 2010
February 22, 2011

1. Evaluate

$$\int (5x^3 + 8x^2 - 4x^2 + 7) dx$$

2. Evaluate

$$\int 6x^2(x^3 - 5) dx$$

3. Evaluate

$$\int \frac{1 + 2x^7}{11x} dx$$

4. Evaluate

$$\int \left(\frac{\sqrt{\pi}}{x^5} + \frac{e^2}{\sqrt{x}} \right) dx$$

5. Find f such that $f'(x) = 5x^2 + 7x - 7$ and $f(0) = 4$.

6. Evaluate

$$\int \frac{e^{3\sqrt{z}}}{\sqrt{z}} dz$$

7. Evaluate

$$\int \frac{2x + 9}{(2x^2 + 18x)^4} dx$$

8. Evaluate

$$\int \frac{3e^{3x}}{1 + e^{3x}} dx$$

9. Approximate the area under the graph of $f(x)$ and above the x -axis with rectangles, using the following methods with $n = 4$.

$$f(x) = -x^2 + 5 \quad \text{from } x = -2 \text{ to } x = 2$$

- (a) Use left endpoints.
- (b) Use right endpoints.
- (c) Average the answers in part (a) and (b).
- (d) Use midpoints.

10. Approximate the area under the graph of $f(x)$ and above the x -axis with rectangles, using the following methods with $n = 4$.

$$f(x) = \frac{1}{x} + 2 \quad \text{from } x = 1 \text{ to } x = 9$$

- (a) Use left endpoints.
- (b) Use right endpoints.
- (c) Average the answers in part (a) and (b).
- (d) Use midpoints.

11. Find the exact values of the integral using formulas from geometry.

$$\int_2^6 (1+x) dx$$

12. Find

$$\int_0^6 (6-x) dx$$

by using the formula for the area of a triangle.

13. Use substitution to evaluate the integral

$$\int_0^1 \sqrt{t^5 + 4t}(5t^4 + 4) dt$$

14. Use substitution to evaluate the integral

$$\int_0^1 t^3(1+t^4)^3 dt$$

15. Evaluate

$$\int_{\sqrt{2}}^1 \left(\frac{u^7}{6} - \frac{1}{u^4} \right) du$$

16. Use definite integrals to find the area between the x -axis and $f(x)$ over the indicated interval.

$$f(x) = 2e^{2x}, \quad [0, \ln 2]$$

17. Find the area of the region bounded by the graphs of the given equations.

$$y = 9x, \quad y = x^3, \quad x = 0, \quad x = 3$$

18. Find the area of the region bounded by the graphs of the given equations.

$$y = 4x + 12, \quad y = x^2$$

19. Find the area between the curves.

$$x = -1, \quad x = 2, \quad y = 2e^{2x}, \quad y = e^{2x} + 1$$

20. Find the producers' surplus if the supply function for the pork bellied is given by the following.

$$S(q) = q^{\frac{7}{2}} + 4q^{\frac{5}{2}} + 55$$

Assume supply and demand are in equilibrium at $q = 4$.