

Chapter 5 Practice Test (Complete all problems)

#1-4: Find the following antiderivatives, be sure to include the plus "C" in your answer.

1) $\int 8x^3 dx$ 2) $\int (8x^3 - 6x^2 + 5) dx$

3) $\int \frac{4}{x^3} dx$ 4) $\int \frac{7}{x} dx$

#5 – 10: Use u-substitution to evaluate the indefinite integrals.

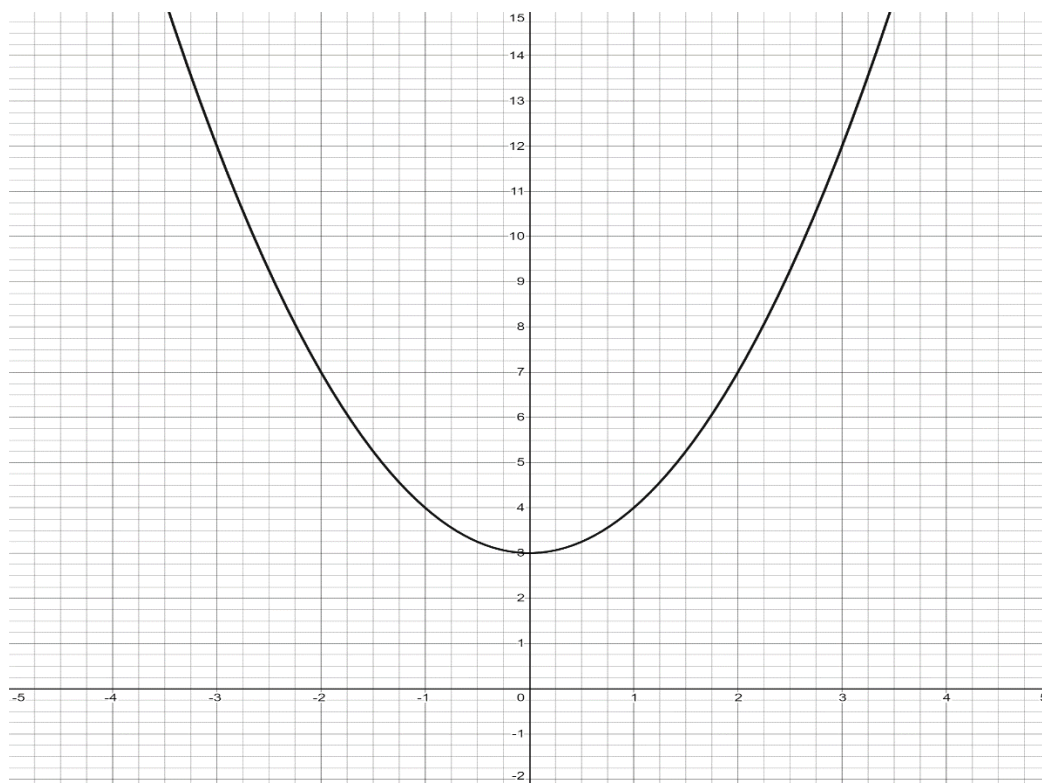
5) $\int 2x(x^2 + 5)^2 dx$ 6) $\int 15x^2 e^{5x^3} dx$

7) $\int 6x(x^2 + 5)^2 dx$ 8) $\int 6xe^{x^2} dx$

9) $\int \frac{4}{4x+1} dx$ 10) $\int \frac{9}{3x+7} dx$

11) Follow the instructions and create rectangles on the provided graph, or one that you create (using right endpoints) to estimate the area between the curve and the x-axis.

$f(x) = x^2 + 3$; from $a = 0$ to $b = 3$ using 3 rectangles



11a) Determine the width of each rectangle that will be used to estimate the area.

(Each rectangle will have a width; $\frac{b-a}{n}$)

11b) Increment by the interval width and draw rectangles on the graph that is provided.

11c) Find the area of each rectangle. (Let the height of the rectangle be the function value at the right endpoint of the rectangle.)

11d) Add the individual areas to get an estimate of the area under the curve

#12-15: Use the Fundamental Theorem of Calculus to evaluate the definite integral.

12) $\int_1^4 (2x - 4) dx$

13) $\int_0^3 (2x)(x^2 + 1)^2 dx$

14) $\int_1^e \frac{2}{x} dx$

15) $\int_0^3 4(2x - 1)^2 dx$

16) $f(x) = 2x - 6$; $[1, 6]$

- Sketch a graph of the function $f(x)$ over the given interval $[a, b]$.
- Find any x-intercept within the interval $[a, b]$.
- Find the area between the x-axis and $f(x)$ over the interval $[a, b]$ using definite integrals. (Find this area by hand)

17)

The function whose graph is represented by the dashed is $f(x) = 2x + 5$

The function whose graph is represented by the solid graph is $g(x) = x^2 + 2$

- Create the integral needed to find the shaded area
- Find the shaded area. Round to 2 decimals as needed. (you may use your calculator to determine the area)

