

Name \_\_\_\_\_

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**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.****Solve the problem.**

1) Determine  $\int (\sqrt{x} + 3\sqrt{x}) dx$

2) Determine  $\int (-5x^{-3} - 3x^5) dx$

3) Use u-substitution to evaluate.

$$\int 14t\sqrt[3]{7t^2 - 15} dt$$

4) Use u-substitution to evaluate

$$\int \frac{x}{(7x^2 + 3)^5} dx$$

5) Evaluate  $\int_0^1 6x^5\sqrt{x^6 + 25} dx$ . Change the limits of integration to u-limits.

**Perform the integration using substitution.**

6)  $\int x^4e^{-x^5} dx$

7)  $\int (x - 6)^5 dx$

**Solve the problem.**

8) A company has determined that the marginal cost of producing a certain item is given by

$$MC(x) = \frac{7x}{\sqrt{x^2 + 2401}} \quad 0 \leq x \leq 49$$

where  $x$  represents the number of items produced daily and  $MC(x)$  is the marginal cost in dollars.i) Evaluate  $MC(65)$  and interpret.ii) Evaluate  $\int_0^{65} MC(x) dx$  and interpret.iii) Knowing that the cost to produce 65 items is \$1570, recover the cost function  $C$ .

iv) Determine the fixed costs.

9) Evaluate  $\int_1^3 \frac{2x^5 - 6}{x^2} dx$

10) Determine the area of the region bounded by  $f(x) = x + 6$  and  $g(x) = -x^2 + 2$  on the interval  $[-2, 2]$ .

11) Use u-substitution to evaluate.

$$\int \frac{15x^2 - 4}{(5x^3 - 4x)^2} dx$$

12) Evaluate  $\int_0^2 \frac{18x}{(3x^2 + 4)^2} dx$ . Change the limits of integration to u-limits.

13) Determine the area of the region bounded by  $f(x) = -3x^2 + 6x + 9$  and the x-axis on the interval  $[-1, 6]$ .

14) Determine the area of the region bounded by  $f(x) = \frac{1}{\sqrt{x}}$  and the x-axis on the interval  $[1, 4]$ .

15) Use u-substitution to evaluate.

$$\int_1^4 \frac{2 \ln x^2}{x} dx$$

16) Use u-substitution to evaluate.

$$\int \frac{e^x + 5e^{-5x}}{e^x - e^{-5x}} dx$$

**Perform the integration using substitution.**

17)  $\int \frac{x}{(7x^2 + 3)^5} dx$

18)  $\int \frac{8s^3 ds}{\sqrt{4 - s^4}}$

19)  $\int \frac{1}{x(\ln x^3)} dx$

**Find the area between the curves.**

20)  $x = 0$ ,  $x = 1$ ,  $y = x^2 + 6$ ,  $y = x^2 + 2$

## Answer Key

Testname: REVTEST42011SUMM

1)  $\frac{2}{3}x^{3/2} + \frac{3}{4}x^{4/3} + C$

2)  $\frac{5}{2x^2} - \frac{1}{2}x^6 + C$

3)  $\frac{3(7t^2 - 15)^{4/3}}{4} + C$

4)  $-\frac{1}{56(7x^2 + 3)^4} + C$

5)  $\frac{52\sqrt{26} - 250}{3} \approx 5.05$

6)  $-\frac{1}{5}e^{-x^5} + C$

7)  $\frac{1}{6}(x - 6)^6 + C$

8) i)  $MC(65) \approx 5.5897$ ;

When daily production is 65 items, it costs \$5.59 to produce the 66<sup>th</sup> item.

ii)  $\int_0^{65} MC(x) dx \approx 226.8017$ ;

The total increase in daily costs of producing the first 65 items is \$226.8.

iii)  $C(x) = 7\sqrt{x^2 + 2401} + 1000$

iv) The fixed costs are \$1343.

9) 36

10)  $\frac{64}{3}$

11)  $-\frac{1}{5x^3 - 4x} + C$

12)  $\frac{9}{16}$

13) 113

14) 2

15)  $\frac{(\ln 16)^2}{2} \approx 3.84$

16)  $\ln |e^x - e^{-5x}| + C$

17)  $\frac{-1}{56(7x^2 + 3)^4} + C$

18)  $-4\sqrt{4 - s^4} + C$

19)  $\frac{1}{3} \ln |\ln x^3| + C$

20) 4