

Math 180 Unit 4 Review

1) Find the **average value** of the function $y = 2x^4$ over the interval $[-2, 2]$ using calculus techniques. Do not approximate.

2) Find the integral $\int xe^{3x^2} - 1 \, dx$

3) Evaluate the integral $\int (3x^2 - 2x + 2)dx$

Evaluate the integral using the fundamental theorem.

4) $\int_0^b 3e^x \, dx$

Evaluate the integral.

5) $\int_0^4 5\sqrt{x} \, dx$

6) $\int_1^3 (2x^3 - 7x^{-2}) \, dx$

Evaluate the integral using the fundamental theorem.

7) $\int_{-3}^{-1} (x^2 + x + 6) \, dx$

Find the integral.

8) $\int (2x^5 - 7x^3 + 6) \, dx$

9) $\int \frac{6 + x^2}{x} \, dx$

10) $\int (5 + x^3)(4 - x^2) \, dx$

11) $\int \frac{x^3 - 7}{x} \, dx$

$$12) \int \frac{t^5}{\sqrt[3]{6+t^6}} dt$$

$$13) \int e^{7x+4} dx$$

$$14) \int (2+2x)e^{(4x+2x^2)} dx$$

$$15) \int 9x^{-5} dx.$$

$$16) \int t e^{-7t^2} dt$$

$$17) \int \left(\frac{\pi^2}{t} - 7e^t \right) dt$$

$$18) \int \frac{1}{3-2x} dx$$

$$19) \int \left[5e^x - \frac{1}{x} \right] dx$$

$$20) \int 3 dx$$

$$21) \int e^{7x+4} dx$$

$$22) \int 13x^{-7} dx$$

$$23) \int x^2 \sqrt{x^3+10} dx$$

$$24) \int (3x^8 - 7x^3 + 5) dx$$

$$25) \int \frac{t^3}{\sqrt[5]{2+t^4}} dt$$

$$26) \int \frac{7x^6 dx}{(6+x^7)^5}$$

$$27) \int (-x^8 + 4)^6 x^7 dx$$

$$28) \int \frac{\ln 8x}{x} dx$$

Provide an appropriate response.

29) Find the average value of the function $y = 5 - x^2$ over the interval $[-3, 2]$.

30) Given $\int_1^3 f(x) dx = 4$ and $\int_1^3 g(x) dx = 2$, use properties of definite integrals to evaluate

$$\int_1^3 [2f(x) + 5g(x)] dx.$$

Answer Key

Testname: MATH180R4SP11

1) $\frac{32}{5}$

2)

3) $x^3 + x^2 + 2x + C$

4) $3e^b - 3$

5) $\frac{80}{3}$

6) 35.33

7) 16.67

8) $\frac{1}{3}x^6 - \frac{7}{4}x^4 + 6x + C$

9) $6 \ln|x| + \frac{1}{2}x^2 + C$

10) $20x - \frac{5}{3}x^3 + x^4 - \frac{1}{6}x^6 + C$

11) $\frac{1}{3}x^3 - 7 \ln|x| + C$

12) $\frac{1}{4}(6 + t^6)^{2/3} + C$

13) $\frac{1}{7}e^{7x} + 4 + C$

14) $\frac{1}{2}e^{(4x + 2x^2)} + C$

15) $-\frac{9}{4}x^{-4} + C$

16) $-\frac{1}{14}e^{-7t^2} + C$

17) $\pi^2 \ln|t| - 7e^t + C$

18) $-\frac{1}{2} \ln|3 - 2x| + C$

19) $5e^x - \ln|x| + C$

20) $3x + C$

21) $\frac{1}{7}e^{7x} + 4 + C$

22) $-\frac{13}{6}x^{-6} + C$

23) $\frac{2}{9}(x^3 + 10)^{3/2} + C$

24) $\frac{1}{3}x^9 - \frac{7}{4}x^4 + 5x + C$

25) $\frac{5}{16}(2 + t^4)^{4/5} + C$

26) $-\frac{1}{4(6 + x^7)^4} + C$

Answer Key

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27) $-\frac{1}{56}(-x^8 + 4)^7 + C$

28) $\frac{(\ln 8x)^2}{2} + C$

29) $\frac{8}{3}$

30) 18