Integral Review

Evaluate each indefinite integral. Note: None of these require u-substitution.

1) $\int 4\,dx$

2) $\int \left(-2x^3 + 15x^2 + 2x\right) dx$

3) $\int \left(\frac{8}{x^3} - \frac{12}{x^5}\right) dx$

4) $\int \sqrt[3]{x^2}\,dx$

5) $\int \left(15x^2 - 8\sqrt[3]{x} + 5\sqrt[4]{x}\right) dx$

6) $\int 6x\left(2x^4 + 1\right) dx$

7) $\int 3e^x\,dx$

8) $\int \frac{5}{x}\,dx$

9) $\int 5\sin x\,dx$

10) $\int 4\sec^2 x\,dx$

Evaluate each indefinite integral.

11) $\int 10x^4(2x^5+1)^5\,dx$

12) $\int \frac{12x^3}{(3x^4-5)^3}\,dx$

13) $\int 5e^{5x}\cdot\left(e^{5x}+3\right)^3\,dx$

14) $\int 4x\sqrt[3]{2x^2-3}\,dx$

15) $\int 48x^2(4x^3+3)^3\,dx$

16) $\int 30x^2(20x^3-4)^3\,dx$

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

18) $\int \frac{12x^2}{4x^3+3}\,dx$

19) $\int 20x^3\cos\left(5x^4-2\right)\,dx$

20) $\int 4x^3\sin\left(2x^4+3\right)\,dx$

Evaluate each definite integral.

21) $\int_{-1}^{3} \left(x^3 - 3x^2 + 4\right) dx$

22) $\int_{-3}^{-1} -\frac{3}{x^2}\, dx$

23) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} -2\cos x\, dx$

24) $\int_{2}^{4} \frac{5}{x}\, dx$

Express each definite integral in terms of u, but do not evaluate.

25) $\int_{-2}^{1} \frac{4x}{\left(2x^2 + 1\right)^2}\, dx;\ u = 2x^2 + 1$

26) $\int_{0}^{1} -6x\left(x^2 + 2\right)^2\, dx;\ u = x^2 + 2$

Evaluate each definite integral.

27) $\int_{-3}^{-1} \frac{4x}{\left(2x^2 + 2\right)^2}\, dx$

28) $\int_{-1}^{0} 12x\left(3x^2 - 4\right)^2\, dx$

For each problem, find the area under the curve over the given interval.

29) $y = x^2 - 4x + 5;\ [0, 3]$

30) $y = \frac{1}{x^2};\ [-2, -1]$

For each problem, find the area of the region enclosed by the curves.

31) $y = 2x^2 + 16x + 29,\ y = -2x - 7,$
$x = -6,\ x = -3$

32) $y = -x^2 + 4x + 6,\ y = x^2 - 4x - 5,$
$x = -1,\ x = 5$

33) $y = -x^2 + 2x,\ y = 2x^3 - 4x,$
$x = -2,\ x = 1.5$

For each problem, find the volume of the solid formed when the given function is rotated 360 degrees on the given integral.

34) $y = \sqrt{36 - x^2}$, the x-axis

35) $y = (2 + x)^2$, from $x = 0$ to $x = 1$