Use Scantron 882E to transfer the answers.

Evaluate.

1) $\int (5x^2 + 1)\ dx$ 1) _____

   A) $\frac{5}{3}x^3 + x + C$ B) $10x + C$ C) $x + C$ D) $\frac{5}{3}x^3 + C$

2) $\int (8x^2 - 3x)\ dx$ 2) _____

   A) $\frac{8}{3}x^3 - \frac{3}{2}x^2 + C$ B) $\frac{8}{3}x^3 + C$

   C) $-\frac{8}{3}x^3 - \frac{3}{2}x^2 + C$ D) $\frac{8}{3}x^2 + \frac{3}{2}x + C$

3) $\int (10t^2 - 4t - 7)\ dt$ 3) _____

   A) $\frac{10}{3}t^3 - 2t^2 - 7t + C$ B) $10t^3 - 4t^2 - 7t + C$

   C) $20t - 4 + C$ D) $5t^3 - 4t^2 - 7t + C$

4) $\int (x - 3)^2\ dx$ 4) _____

   A) $\frac{1}{3}x^3 - 3x^2 + 9x + C$ B) $\frac{1}{3}x^3 + 3x^2 - 9x + C$

   C) $3x^3 - 12x^2 + 9x + C$ D) $\frac{1}{3}x^3 + 9x + C$

5) $\int (x^3 - 5x)\ dx$ 5) _____

   A) $\frac{x^3}{3} - \frac{5x^2}{2} + C$ B) $\frac{x^4}{4} + 5x^2 + C$ C) $3x^2 - 5 + C$ D) $\frac{x^4}{4} - \frac{5x^2}{2} + C$

6) $\int (3x^8 - 7x^3 + 6)\ dx$ 6) _____

   A) $9x^9 - \frac{7}{4}x^4 + 6x + C$ B) $\frac{1}{3}x^9 - \frac{7}{4}x^4 + 6x + C$

   C) $9x^9 - \frac{7}{3}x^4 + 6x + C$ D) $\frac{1}{3}x^9 - \frac{7}{3}x^4 + 6x + C$

7) $\int 15x^{-8}\ dx$ 7) _____

   A) $\frac{15}{7x^9} + C$ B) $\frac{105}{x^7} + C$ C) $-\frac{15}{7}x^{-7} + C$ D) $-120x^{-9} + C$

8) $\int \dfrac{61}{x}$ dx

8) _____

A) $\ln\left(\dfrac{x}{61}\right)$ + C   B) 61 ln x + C   C) $\dfrac{61}{2}$x^{-2} + C   D) 61x + C

9) $\int \dfrac{37}{x^2}$ dx

9) _____

A) $\dfrac{37}{x}$ + C   B) –37x + C   C) 37x + C   D) – $\dfrac{37}{x}$ + C

10) $\int 23x^{1/4}$ dx

10) _____

A) $\dfrac{92}{5}$x$^{5/4}$ + C   B) $\dfrac{23}{4}$x$^{5/4}$ + C   C) $\dfrac{23}{5}$x^5 + C   D) 23x$^{5/4}$ + C

11) $\int 12x^3 \sqrt{x}$ dx

11) _____

A) $\dfrac{2}{9}$x$^{9/2}$ + C   B) $\dfrac{24}{7}$x$^{9/2}$ + C   C) $\dfrac{8}{3}$x$^{9/2}$ + C   D) $\dfrac{11}{5}$x$^{9/2}$ + C

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

12) _____

A) 6x$^{5/3}$ + C   B) $\dfrac{4}{3}$x$^{5/3}$ + C   C) $\dfrac{8}{3}$ x$^{5/3}$ + C   D) $\dfrac{12}{5}$x$^{5/3}$ + C

13) $\int (x^{4/3} - 3x^{5/2})$ dx

13) _____

A) $\dfrac{3}{4}$ x$^{7/3}$ – $\dfrac{3}{7}$ x$^{7/2}$ + C   B) $\dfrac{3}{7}$ x$^{7/3}$ – $\dfrac{2}{7}$ x$^{7/2}$ + C

C) $\dfrac{3}{4}$ x$^{7/3}$ – $\dfrac{4}{7}$ x$^{7/2}$ + C   D) $\dfrac{3}{7}$ x$^{7/3}$ – $\dfrac{6}{7}$ x$^{7/2}$ + C

14) $\int 8e^{4x}$ dx

14) _____

A) 2e^{4x} + C   B) $\dfrac{1}{4}$ e^{4x} + C   C) 4e^{4x} + C   D) $\dfrac{1}{2}$ e^{4x} + C

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

15) _____

A) $\dfrac{x^7}{7}$ + $\dfrac{e^{3x}}{3}$ + C   B) $\dfrac{x^7}{7}$ + e^{3x} + C   C) $\dfrac{x^5}{5}$ + 3e^{3x} + C   D) $\dfrac{x^7}{7}$ + $\dfrac{e^{4x}}{4}$ + C

Find f such that the given conditions are satisfied.

16) $f'(x) = x - 6$, $f(2) = 0$

    A) $f(x) = x^2 - 6x$

    B) $f(x) = \dfrac{x^2}{2} - 6x + 11$

    C) $f(x) = x^2 - 6x + 8$

    D) $f(x) = \dfrac{x^2}{2} - 6x + 10$

16) _____

17) $f'(x) = x^2 - 7x + 11$, $f(0) = 6$

    A) $f(x) = \dfrac{1}{3}x^3 - 8x^2 + 11x + 1$

    B) $f(x) = \dfrac{1}{3}x^3 - \dfrac{7}{2}x^2 + 11x + 1$

    C) $f(x) = \dfrac{1}{3}x^3 - \dfrac{7}{2}x^2 + 11x + 6$

    D) $f(x) = \dfrac{1}{3}x^3 - 8x^2 + 11x + 6$

17) _____

18) $f'(x) = 5x^2 - 7x + 4$, $f(0) = 2$

    A) $f(x) = \dfrac{5}{3}x^3 - \dfrac{7}{2}x^2 + 4x - 2$

    B) $f(x) = \dfrac{5}{3}x^3 - \dfrac{7}{2}x^2 + 4x + 2$

    C) $f(x) = \dfrac{5}{3}x^3 - \dfrac{7}{2}x^2 + 4x - 4$

    D) $f(x) = \dfrac{5}{3}x^3 + \dfrac{7}{2}x^2 + 4x + 2$

18) _____

19) $f'(x) = \sqrt{x} - \dfrac{1}{\sqrt{x}}$, $f(9) = 17$

    A) $f(x) = x^{3/2} - 2\sqrt{x} + 5$

    B) $f(x) = \dfrac{2}{3}x^{3/2} - \sqrt{x} + 2$

    C) $f(x) = \dfrac{2}{3}x^{3/2} - 2\sqrt{x} + 5$

    D) $f(x) = \dfrac{1}{2}x^2 - 2\sqrt{x}$

19) _____

Evaluate the indefinite integral.

20) $\displaystyle\int (x - 4)^2\, x^2\, dx$

    A) $\dfrac{x^5}{4} - \dfrac{8}{3}x^4 + 8x^3 + C$

    B) $x^5 - 8x^4 + 16x^3 + C$

    C) $4x^3 - 2x^4 + \dfrac{16}{3}x^2 + C$

    D) $\dfrac{x^5}{5} - 2x^4 + \dfrac{16}{3}x^3 + C$

20) _____

21) $\displaystyle\int \dfrac{x^5 - 5x + 6}{x^2}\, dx$

    A) $x^4 - 5\ln|x| + \dfrac{6}{x} + C$

    B) $\dfrac{x^4}{4} - \dfrac{5}{2}x^2 - \dfrac{6}{x} + C$

    C) $\dfrac{x^4}{4} - 5\ln|x| - \dfrac{6}{x} + C$

    D) $\dfrac{x^4}{4} + \dfrac{5}{x^2} - \dfrac{12}{x^3} + C$

21) _____

22) $\int (x - 4)(2x + 5) \, dx$ 22) _____

    A) $\frac{2}{3}x^3 - 4x^2 - 20x + C$ B) $\frac{2}{3}x^3 - \frac{3}{2}x^2 - 20x + C$

    C) $2x^3 - 3x^2 - 20x + C$ D) $4x - 3 + C$

Find the integral.

23) $\int (4x^{11} - 7x^3 + 6) \, dx$ 23) _____

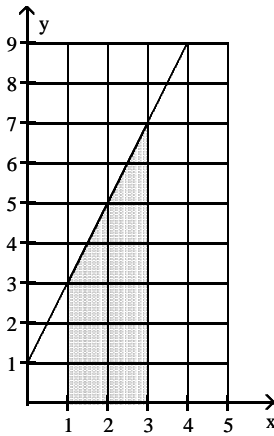   A) $\frac{1}{4}x^{12} - \frac{7}{3}x^4 + 6x + C$ B) $12x^{12} - \frac{7}{3}x^4 + 6x + C$

    C) $\frac{1}{3}x^{12} - \frac{7}{4}x^4 + 6x + C$ D) $12x^{12} - \frac{7}{4}x^4 + 6x + C$

Find the area under the given curve over the indicated interval.

24) $y = 2x + 1$; $[1, 3]$ 24) _____

    A) 12.5   B) 10   C) 5   D) 7.5
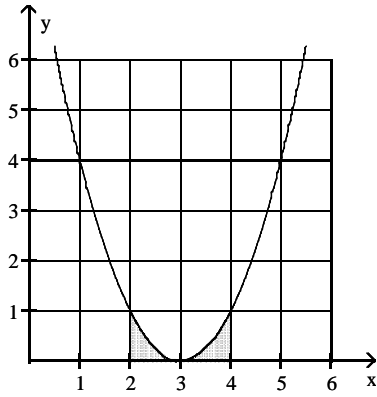
25) $y = \frac{1}{x}$; $[0.5, 2]$ 25) _____

    A) 1.69   B) 1.25   C) 1.50   D) 1.39

26) $y = (x - 3)^2$; [2, 4]

A) $\dfrac{2}{3}$ B) $\dfrac{4}{3}$ C) $\dfrac{5}{3}$ D) $\dfrac{1}{3}$

26) _____

Find the area under the graph of the function over the interval given.

27) $y = 2x + 7$; [1, 5]

A) 9   B) 18   C) 52   D) 26

27) _____

28) $y = x^2 - 6x + 9$; [2, 4]

A) $\dfrac{2}{3}$ B) $\dfrac{4}{3}$ C) $\dfrac{7}{3}$ D) $\dfrac{1}{3}$

28) _____

29) $y = \dfrac{3}{x^3}$; [1, 3]

A) $\dfrac{1}{2}$ B) 3   C) $\dfrac{4}{3}$ D) $\dfrac{1}{3}$

29) _____

30) $y = -x^2 + 9$; [0, 3]

A) 36   B) 18   C) 0   D) 27

30) _____

31) $y = x^2(x - 2)^2$; [0, 2]

A) $\dfrac{17}{15}$ B) $\dfrac{15}{16}$ C) $\dfrac{15}{17}$ D) $\dfrac{16}{15}$

31) _____

32) $y = \dfrac{1}{\sqrt{x}}$; [1, 4]

A) 4   B) 2   C) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$

32) _____

33) $y = \dfrac{9}{x}$; [1, 8]
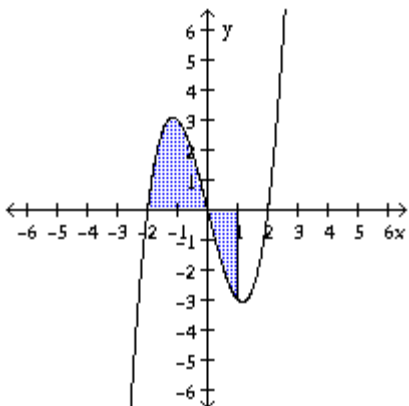
A) ln 8   B) ln 72   C) 8 ln 9   D) 9 ln 8

33) _____

Evaluate the definite integral and interpret the result.
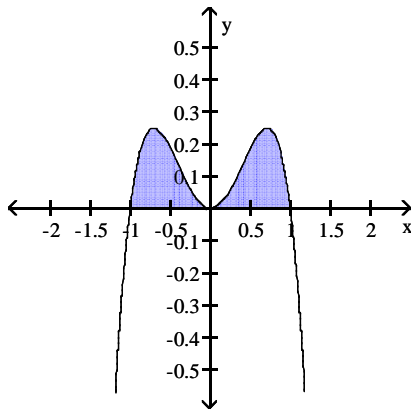
34) $\int_{-2}^{1} (x^3 - 4x)\, dx$

34) _____

A) –3; the area between the x–axis and the graph of $y = x^3 - 4x$ over the interval [–2, 0] minus the area between the x–axis and the graph of $y = x^3 - 4x$ over the interval [0, 1] is –3.

B) $\frac{9}{4}$; the area between the x–axis and the graph of $y = x^3 - 4x$ over the interval [–2, 0] minus

the area between the x–axis and the graph of $y = x^3 - 4x$ over the interval [0, 1] is $\frac{9}{4}$.

C) –9; the area under the graph of $y = x^3 - 4x$ over the interval [–2, 1] is –9.

D) $\frac{9}{4}$; the area between the x–axis and the graph of $y = x^3 - 4x$ over the interval [–2, 1] is $\frac{9}{4}$.
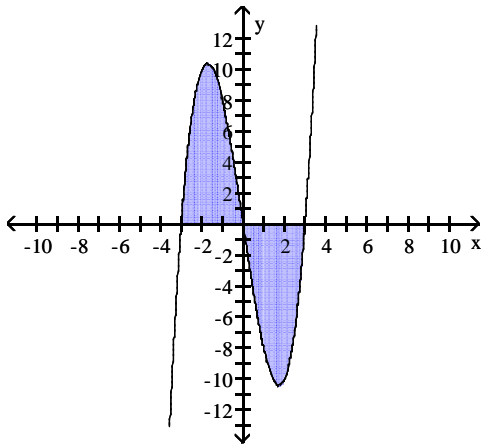
35) $\int_{-1}^{1} (x^2 - x^4)\, dx$

35) _____

A) $-\frac{1}{15}$; the area bounded by the x–axis and the graph of $y = x^2 - x^4$ is $-\frac{1}{15}$.

B) $\frac{4}{15}$; the area bounded by the x–axis and the graph of $y = x^2 - x^4$ is $\frac{4}{15}$.

C) $\frac{2}{15}$; the area bounded by the x–axis and the graph of $y = x^2 - x^4$ is $\frac{2}{15}$.

D) $-\frac{2}{15}$; the area bounded by the x–axis and the graph of $y = x^2 - x^4$ is $-\frac{2}{15}$.

36) $\int_{-3}^{3} (x^3 - 9x)\ dx$

36) _____

A) 81; the shaded area above the x–axis minus the shaded area below the x–axis equals 81.
B) 81; the shaded area above the x–axis plus the shaded area below the x–axis equals 81.
C) 9; the shaded area above the x–axis minus the shaded area below the x–axis equals 9.
D) 0; the shaded area above the x–axis is equal to the shaded area below the x–axis.

Evaluate.

37) $\int_{0}^{16} 2\sqrt{x}\ dx$

37) _____

    A) 16   B) 128   C) $\dfrac{256}{3}$ D) 192

38) $\int_{0}^{b} 3e^{x}\ dx$

38) _____

    A) $\dfrac{3e^{b+1}}{b+1} - \dfrac{e}{2}$ B) $3e^{b}$ C) $3e^{b} - 1$ D) $3e^{b} - 3$

39) $\int_{0}^{b} 9x^{8}\ dx$

39) _____

    A) $\dfrac{1}{9}b^{9}$ B) $9b^{9}$ C) b^{9} D) b^{7}

40) $\int_{-2}^{6} 6x^{5}\ dx$

40) _____

    A) 279,552   B) –46,592   C) 46,592   D) 1280

41) $\int_{0}^{3} (4x + 3)(5x - 1)\ dx$

41) _____

    A) 120   B) 51   C) $\dfrac{441}{2}$ D) 630

42) $\displaystyle\int_{3}^{4} (t + \sqrt{2})(t - \sqrt{2})\, dt$

42) _____

    A) 23   B) $\dfrac{31}{3}$ C) $-\dfrac{5}{3}$ D) 35
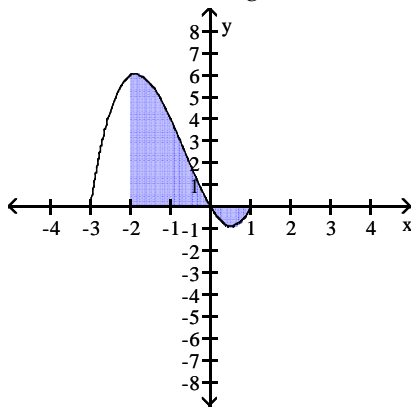
Find the area of the shaded region.

43) $f(x) = x^3 + 2x^2 - 3x,\ \ g(x) = 0$

43) _____

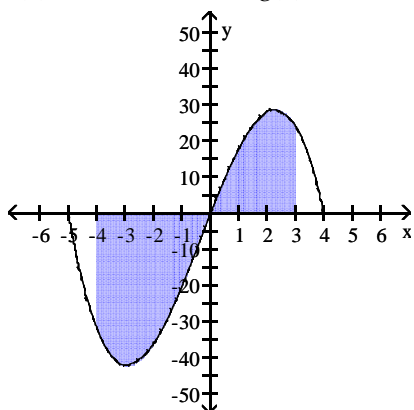   A) $-\dfrac{81}{12}$ B) $\dfrac{95}{12}$ C) $\dfrac{47}{12}$ D) $\dfrac{81}{12}$

44) $f(x) = -x^3 - x^2 + 20x,\ \ g(x) = 0$
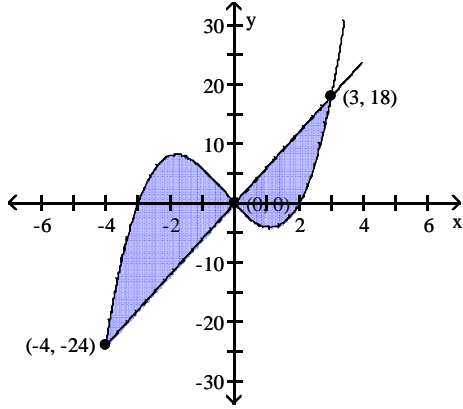
44) _____

    A) $\dfrac{2137}{12}$ B) $-\dfrac{679}{12}$ C) $\dfrac{1625}{12}$ D) $-\dfrac{81}{12}$

8

45) $f(x) = x^3 + x^2 - 6x, \ g(x) = 6x$ 45) _____

A) $\dfrac{937}{12}$ B) $\dfrac{768}{12}$ C) $\dfrac{343}{12}$ D) $\dfrac{81}{12}$

Solve the problem.

46) A computer manufacturer has found that its expenditure rate per day (in hundreds of dollars) on a   46) _____
certain type of job is given by $C'(x) = 10x + 6$, where x is the number of days since the start of the
job. Find the expenditure if the job takes 8 days.
  A) $36,800   B) $8600   C) $86   D) $368

47) A company has found that its expenditure rate per day (in hundreds of dollars) on a certain type of   47) _____
job is given by $E'(x) = 10x + 11$, where x is the number of days since the start of the job. Find the
expenditure if the job takes 6 days.
  A) $246   B) $24,600   C) $7100   D) $71

48) The rate at which an assembly line worker's efficiency E (expressed as a percent) changes with   48) _____
respect to time t is given by $E'(t) = 75 - 6t$, where t is the number of hours since the worker's shift
began. Assuming that $E(1) = 92$, find $E(t)$.
  A) $E(t) = 75t - 3t^2 + 20$ B) $E(t) = 75t - 6t^2 + 20$
  C) $E(t) = 75t - 3t^2 + 92$ D) $E(t) = 75t - 3t^2 + 164$

49) Red Plains Roasting has found that the cost, in dollars per pound, of the peanuts it roasts, is   49) _____
    $C'(x) = -0.014x + 6.50, \ \text{for } x \le 500,$
where x is the number of pounds of peanuts roasted. Find the total cost of roasting 300 pounds of
peanuts.
  A) $2.30   B) $2640.00   C) $1320.00   D) $4.40

50) Creamy Bugs Yogurt has found that the cost, in dollars per pound, of the yogurt it produces, is   50) _____
    $C'(x) = -0.003x + 4.50, \ \text{for } x \le 300,$
where x is the number of pounds of yogurt produced. Find the total cost of producing 260 pounds
of yogurt.
  A) $4.11   B) $3.72   C) $1068.60   D) $2137.20