

CHAPTER 5, FORM A

1. (2, \$9)
 2. \$14.67
 3. \$9.33
 4. \$12,295.39
 5. \$47,640.89
 6. 350.1 million metric tons
 7. 56.77 yr after 2004
 8. \$4,796.83 per yr
 9. \$573,282.52
 10. \$1,764,504.40
 11. Convergent; $\frac{1}{8}$
 12. Divergent
 13. $\frac{4}{81}, f(x) = \frac{4}{81}x^3$ on $[0, 3]$
 14. 0.3127
 15. $E(x) = \frac{76}{15}$
 16. $E(x^2) = 26$
 17. $\mu = \frac{76}{15}$
 18. $\sigma^2 = \frac{74}{225}$
 19. $\sigma = \frac{\sqrt{74}}{15}$
 20. 45th percentile
 21. 0.4893
 22. 0.1330
 23. 0.8975
 24. 0.0594
 25. 87
 26. $\frac{5\pi}{6}$
 27. $\frac{25\pi}{2}$
 28. $y = C_1 e^{0.5x^8}$ where $C_1 = \pm e^c$
 29. $y = \sqrt{16x + C_1}$,
 $y = -\sqrt{16x + C_2}$ where $C_1 = 2c$
 30. $y = 7e^{3t}$
 31. $y = C_1 e^{-x^{11/11}} + 5$, where $C_1 = \pm e^{-c}$
 32. $r = \pm \sqrt[6]{-24t + C_1}$, where $C_1 = 6c$
 33. $y = C_1 e^{7x+x^2/2}$ where $C_1 = \pm e^c$
 34. $q = \frac{C_1}{x^{10}}$ where $C_1 = e^{-c}$
 35. (a) $V(t) = 21(1 - e^{-kt})$
(b) $k = 0.16$
(c) $V(t) = 21(1 - e^{-0.16t})$
(d) \$19.09
(e) $t \approx 7.8$ months
 36. $\sqrt[12]{12}$
 37. Convergent; $\frac{2}{e}$
 38. 9.07
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CHAPTER 5, FORM B

1. (2, \$16)
2. \$18.67
3. \$17.33
4. \$18,794.24
5. \$91,824.82
6. 514.9 million metric tons
7. 42.05 yr after 2004
8. \$4985.98 per yr
9. \$1,182,191.91
10. \$532,686.54
11. Convergent; $\frac{1}{5}$
12. Divergent
13. $\frac{3}{64}$, $f(x) = \frac{3}{64}x^2$ on $[0, 4]$
14. 0.9219
15. $E(x) = \frac{28}{9}$
16. $E(x^2) = 10$
17. $\mu = \frac{28}{9}$
18. $\sigma^2 = \frac{26}{81}$
19. $\sigma = \frac{\sqrt{26}}{9}$
20. 41.7th percentile
21. 0.4032
22. 0.2563
23. 0.6466
24. 0.0475
25. \$14.97
26. $\frac{175\pi}{3}$
27. 28π
28. $y = C_1 e^{1.25x^4}$ where $C_1 = \pm e^c$
29. $y = \sqrt{8x + C_1}$, $y = -\sqrt{8x + C_1}$, where $C_1 = 2c$
30. $y = 3e^{7t}$
31. $y = C_1 e^{-x^6/6} + 5$, where $C_1 = \pm e^{-c}$
32. $r = \sqrt[9]{-18t + C_1}$, where $C_1 = 9c$
33. $y = C e^{11x + x^2/2}$, where $C_1 = \pm e^c$
34. $q = \frac{C_1}{x^3}$, where $C_1 = e^{-c}$
35. (a) $V(t) = 50(1 - e^{-kt})$
 (b) $k = 0.05$
 (c) $V(t) = 50(1 - e^{-0.05t})$
 (d) \$26.38
 (e) $t \approx 24.1$ months
36. $\sqrt[8]{8}$
37. Divergent
38. 8.89

CHAPTER 5, FORM C

1. (3, \$25)
2. \$54
3. \$40.50
4. \$5,183.57
5. \$106,873.47
6. 932.8 million metric tons
7. 33.19 yr after 2005
8. \$3851.70 per yr
9. \$1,253,545.97
10. 1,086,861.67
11. Convergent; $\frac{1}{24}$
12. Divergent
13. $\frac{3}{32}$, $f(x) = \frac{3}{32}x^5$ on $[0, 2]$
14. 0.3297
15. $E(x) = \frac{31}{9}$
16. $E(x^2) = 13$
17. $\mu = \frac{31}{9}$
18. $\sigma^2 = \frac{92}{81}$
19. $\sigma = \frac{\sqrt{92}}{9}$ or $\frac{2\sqrt{23}}{9}$
20. 62.5th percentile
21. 0.4332
22. 0.2481
23. 0.9034
24. 0.9599
25. 85
26. 8π
27. $\frac{133\pi}{2}$
28. $y = C_1 e^{x^4}$, where $C_1 = \pm e^c$
29. $y = \sqrt{6x + C_1}$, $y = -\sqrt{6x + C_1}$ where $C_1 \pm 2c$
30. $y = 4e^{5t}$
31. $y = C_1 e^{-x^4/4} + 6$, where $C_1 = \pm e^{-c}$
32. $r = \pm \sqrt[10]{60t + C_1}$, where $C_1 = 10c$
33. $y = C_1 e^{5x - x^2/2}$, where $C_1 = \pm e^c$
34. $q = \frac{C_1}{x^8}$, where $C_1 = e^{-c}$
35. (a) $V(t) = 25(1 - e^{-kt})$
(b) $k = 0.08$
(c) $V(t) = 25(1 - e^{-0.08t})$
(d) \$17.47
(e) $t \approx 15.9$ months
36. $\sqrt[6]{6}$
37. Convergent; $\frac{1}{10e}$
38. 6.28, or 2π

CHAPTER 5 FORM D

1. (4, \$25)
2. \$101.33
3. \$58.67
4. \$3026.75
5. \$163,834.40
6. 533.4 million metric tons
7. 40.0 yr after 2005
8. \$6242.65 per yr
9. \$1,803,246.56
10. \$828,402.54
11. Convergent; $\frac{1}{2}$
12. Divergent
13. $\frac{5}{243}$, $f(x) = \frac{5}{243}x^4$ on $[0, 3]$
14. 0.7769
15. $E(x) = \frac{8}{3}$
16. $E(x^2) = 8$
17. $\mu = \frac{8}{3}$
18. $\sigma^2 = \frac{8}{9}$
19. $\sigma = \frac{2\sqrt{2}}{3}$
20. 25th percentile
21. 0.2881
22. 0.3551
23. 0.9502
24. 0.7967
25. \$28.59
26. 645π
27. 12π
28. $y = C_1 e^{2x^5}$ where $C_1 = \pm e^c$
29. $y = \sqrt{10x + C_1}$,
 $y = -\sqrt{10x + C_1}$ where $C_1 = 2c$
30. $y = 5e^{6t}$
31. $y = C_1 e^{-x^4/4} + 2$, where $C_1 = \pm e^{-c}$
32. $r = \sqrt[3]{-15t + C_1}$, where $C_1 = 3c$
33. $y = C_1 e^{9x-x^2/2}$, where $C_1 = \pm e^c$
34. $q = \frac{C_1}{x^3}$, where $C_1 = e^{-c}$
35. (a) $V(t) = 15(1 - e^{-kt})$
(b) $k = 0.13$
(c) $V(t) = 15(1 - e^{-0.13t})$
(d) \$12.87
(e) $t \approx 12.4$ months
36. $\sqrt[3]{7}$
37. Convergent; $\frac{2}{3e}$
38. 12.70

CHAPTER 5, FORM E

1. (2, \$4)
2. \$10.67
3. \$5.33
4. \$10,317.09
5. \$29,127.06
6. 818.1 million metric tons
7. 26.5 yr after 2006
8. \$5999.49 per yr
9. \$800,598.67
10. \$898,364.94
11. Convergent; $\frac{1}{18}$
12. Divergent
13. $\frac{7}{128}, f(x) = \frac{7}{128}x^6$ on $[0, 2]$
14. 0.5852
15. $E(x) = \frac{148}{21}$
16. $E(x^2) = 50$
17. $\mu = \frac{148}{21}$
18. $\sigma^2 = \frac{146}{441}$
19. $\sigma = \frac{\sqrt{146}}{21}$
20. 46.4th percentile
21. 0.4821
22. 0.2464
23. 0.9595
24. 0.0099
25. 83.4
26. $\frac{1000\pi}{81}$
27. $\frac{\pi}{2e^6}(e^{16} - 1)$ or $\frac{\pi e^{-6}}{2}(e^{16} - 1)$
28. $y = C_1 e^{0.5x^6}$ where $C_1 \neq 0$
29. $y = \sqrt{12x + C_1}$,
 $y = -\sqrt{12x + C_1}$ where $C_1 = 2c$
30. $y = 3e^{8t}$
31. $y = C_1 e^{-x^5/5} + 10$, where $C_1 = \pm e^{-c}$
32. $r = \pm \sqrt[8]{48t + C_1}$, where $C_1 = 8c$
33. $y = C_1 e^{6x+x^2/2}$, where $C_1 = \pm e^c$
34. $q = \frac{C_1}{x^7}$, where $C_1 = e^{-c}$
35. (a) $V(t) = 30(1 - e^{-kt})$
(b) $k = 0.23$
(c) $V(t) = 30(1 - e^{-0.23t})$
(d) \$29.05
(e) $t \approx 4.8$ months
36. $\sqrt[5]{5}$
37. Convergent; $\frac{3}{5}$
38. 11.11

CHAPTER 5, FORM F

1. (2, \$16)
2. \$18.67
3. \$5.33
4. \$15,142.19
5. \$85,657.53
6. 539.3 million metric tons
7. 32.4 yr after 2006
8. \$3541.02 per year
9. \$887,356.87
10. \$4,770,493.73
11. Convergent; $\frac{1}{81}$
12. Divergent
13. $\frac{2}{243}, f(x) = \frac{2}{243}x^5$ on $[0, 3]$
14. 0.6671
15. $E(x) = \frac{14}{9}$
16. $E(x^2) = \frac{5}{2}$
17. $\mu = \frac{14}{9}$
18. $\sigma^2 = \frac{13}{162}$
19. $\sigma = \frac{\sqrt{26}}{18}$
20. 41.7th percentile
21. 0.2995
22. 0.2108
23. 0.8647
24. 0.8749
25. \$11.87
26. $\frac{128\pi}{9}$
27. $\frac{15\pi}{2}$
28. $y = C_1 e^{1.5x^4}$ where $C_1 = \pm e^c$
29. $y = \sqrt{6x + C_1}$,
 $y = -\sqrt{6x + C_1}$, where $C_1 = 2c$
30. $y = 2e^{9t}$
31. $y = C_1 e^{-x^5/5} + 4$, where $C_1 = \pm e^{-c}$
32. $r = \sqrt[3]{21t + C_1}$, where $C_1 = 7c$
33. $y = C_1 e^{8x-x^2/2}$, where $C_1 = \pm e^c$
34. $q = \frac{C_1}{x^9}$, where $C_1 = e^{-c}$
35. (a) $V(t) = 35(1 - e^{-kt})$
(b) $k = 0.14$
(c) $V(t) = 35(1 - e^{-0.14t})$
(d) \$30.71
(e) $t \approx 4.0$ months
36. $\sqrt[9]{9}$
37. Convergent; $\frac{1}{5e}$
38. 37.70