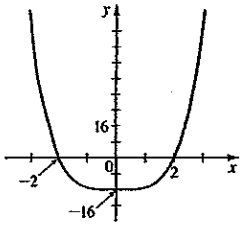


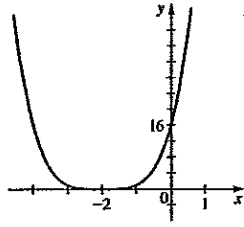
Answers to Chapter 8

Sec. 8.1

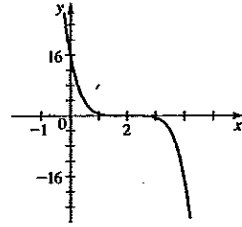
2. (a)



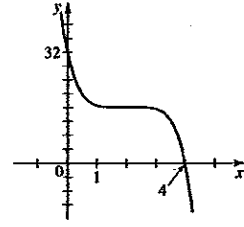
(b)



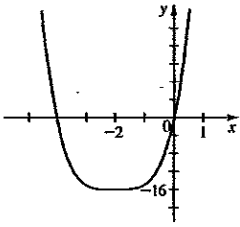
(c)



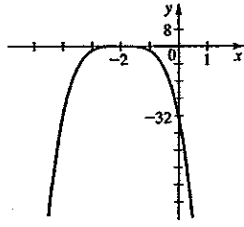
(d)



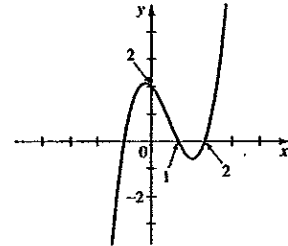
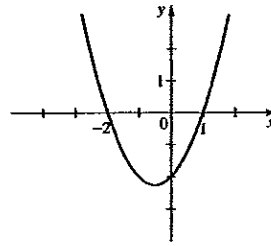
(c)



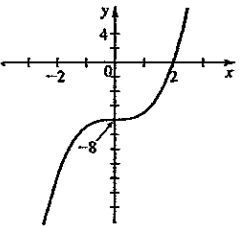
(d)



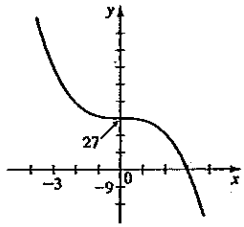
5. III 6. I 7. V 8. II 9. VI 10. IV
11. 12.



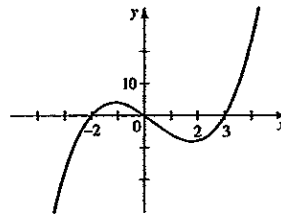
3. (a)



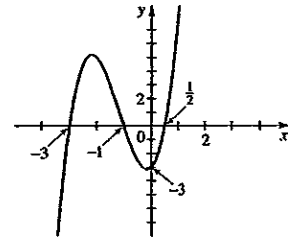
(b)



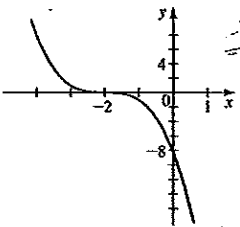
13.



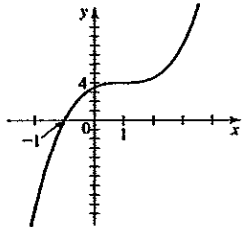
14.



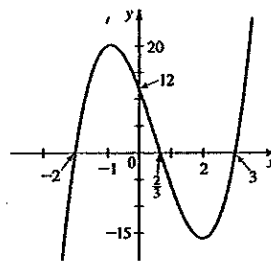
(c)



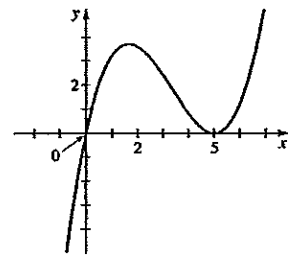
(d)



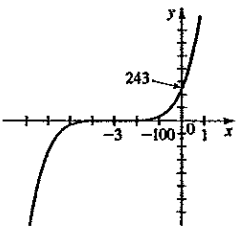
15.



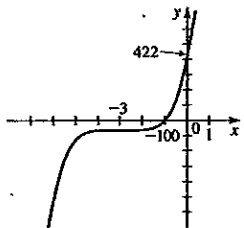
16.



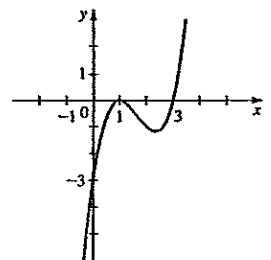
4. (a)



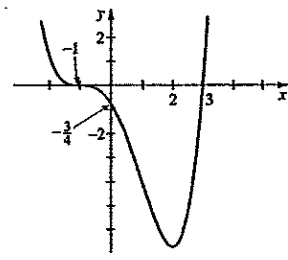
(b)



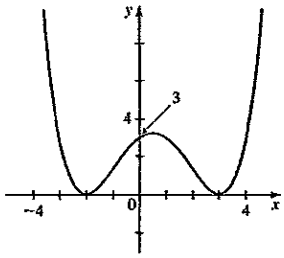
17.



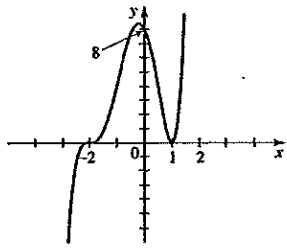
18.



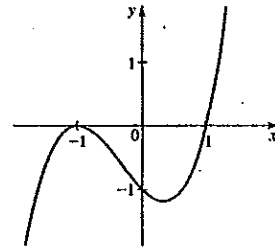
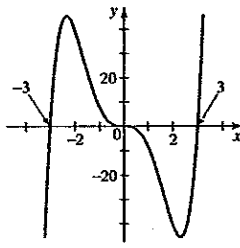
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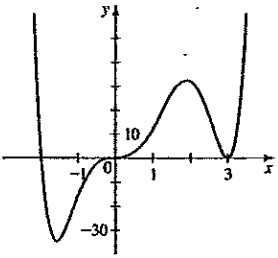
20.



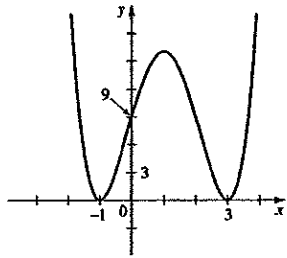
28. $P(x) = x^3(x + 3)(x - 3)$ 29. $P(x) = (x + 1)^2(x - 1)$



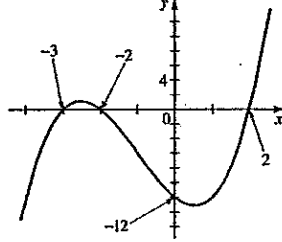
21.



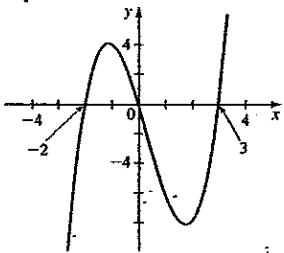
22.



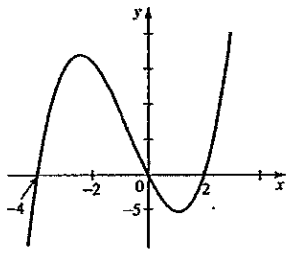
30. $P(x) = (x + 3)(x - 2)(x + 2)$



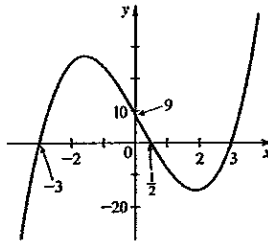
23. $P(x) = x(x + 2)(x - 3)$



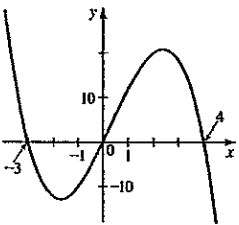
24. $P(x) = x(x - 2)(x + 4)$



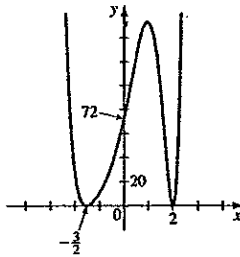
31. $P(x) = (2x - 1)(x + 3)(x - 3)$



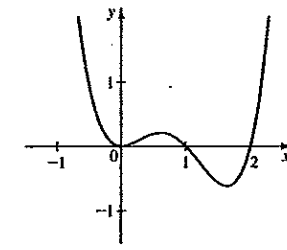
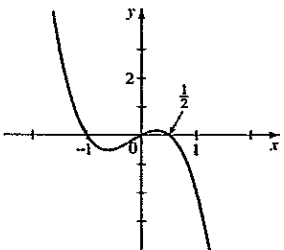
25. $P(x) = -x(x + 3)(x - 4)$



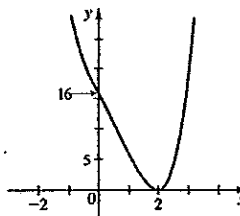
32. $P(x) = \frac{1}{8}(x - 2)^2(2x + 3)^2(x^2 + 2x + 4)^2$



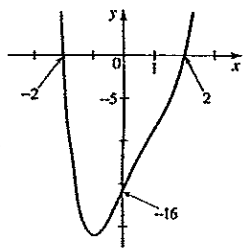
26. $P(x) = -x(2x - 1)(x + 1)$ 27. $P(x) = x^2(x - 1)(x - 2)$



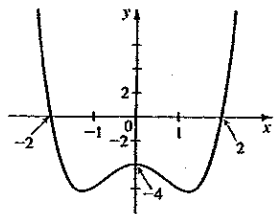
33. $P(x) = (x - 2)^2(x^2 + 2x + 4)$



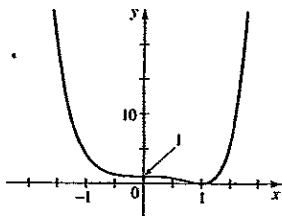
34. $P(x) = (x + 2)(x - 2)(x^2 - 2x + 4)$



35. $P(x) = (x^2 + 1)(x + 2)(x - 2)$



36. $P(x) = (x - 1)^2(x^2 + x + 1)^2$



37. $y \rightarrow \infty$ as $x \rightarrow \infty$, $y \rightarrow -\infty$ as $x \rightarrow -\infty$

38. $y \rightarrow -\infty$ as $x \rightarrow \infty$, $y \rightarrow \infty$ as $x \rightarrow -\infty$

39. $y \rightarrow \infty$ as $x \rightarrow \pm\infty$

40. $y \rightarrow -\infty$ as $x \rightarrow \infty$, $y \rightarrow \infty$ as $x \rightarrow -\infty$

41. $y \rightarrow \infty$ as $x \rightarrow \infty$, $y \rightarrow -\infty$ as $x \rightarrow -\infty$

42. $y \rightarrow -\infty$ as $x \rightarrow \pm\infty$

43. (a) x-intercepts 0, 4; y-intercept 0 (b) (2, 4)

44. (a) x-intercepts 0, 4.5; y-intercept 0

(b) (0, 0), (3, -3)

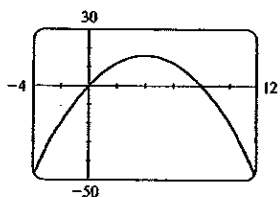
45. (a) x-intercepts -2, 1; y-intercept -1

(b) (-1, -2), (1, 0)

46. (a) x-intercepts 0, 4; y-intercept 0

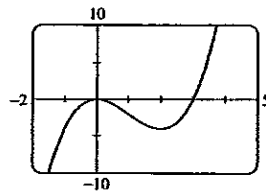
(b) (3, -3)

47.



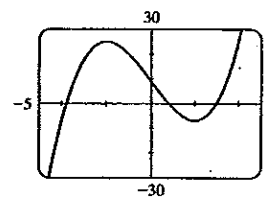
local maximum (4, 16)

48.



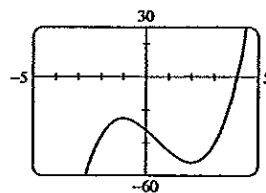
local minimum (2, -4),
local maximum (0, 0)

49.



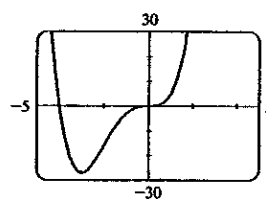
local maximum (-2, 25),
local minimum (2, -7)

50.



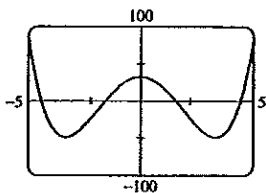
local minimum (2, -52),
local maximum (-1, -25)

51.



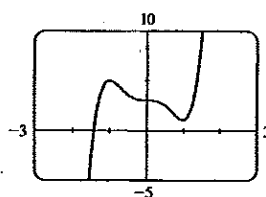
local minimum (-3, -27)

52.



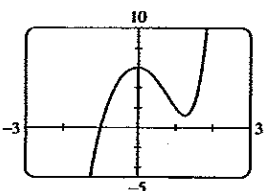
local minima (-3, -49)
and (3, -49),
local maximum (0, 32)

53.



local maximum (-1, 5),
local minimum (1, 1)

54.



local maximum (0, 6),
local minimum (1.26, 1.24)

55. One local maximum,
no local minimum

56. No local extremum

57. One local maximum, one local minimum

58. No local extremum

59. One local maximum, two local minima

60. Two local maxima, two local minima

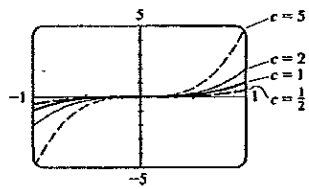
61. No local extrema

62. One local minimum

63. One local maximum, two local minima

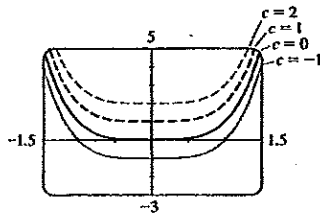
64. One local maximum, one local minimum

65.



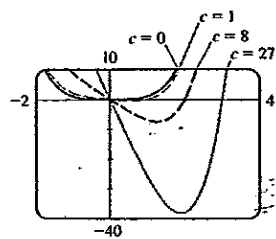
Increasing the value of c stretches the graph vertically.

67.



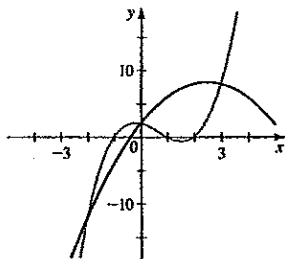
Increasing the value of c moves the graph up.

69.



Increasing the value of c causes a deeper dip in the graph in the fourth quadrant and moves the positive x -intercept to the right.

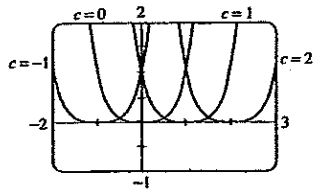
71. (a)



(b) Three (c) $(0, 2)$, $(3, 8)$, $(-2, -12)$

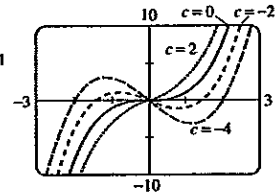
72. ① is $y = x^4$; ② is $y = x^2$; ③ is $y = x^6$; ④ is $y = x^3$; ⑤ is $y = x^5$

66.



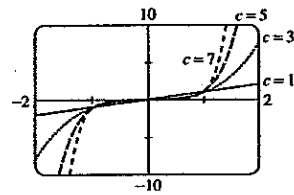
Increasing the value of c shifts the graph to the right.

68.



Increasing the value of c makes the "bumps" in the graph flatter.

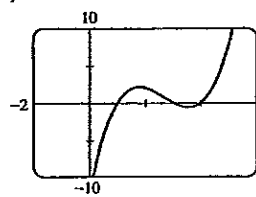
70.



The larger c gets, the flatter the graph is near the origin, and the steeper it is away from the origin.

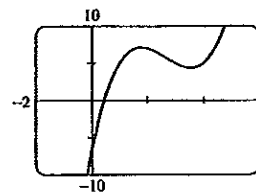
73. (d) $P(x) = P_O(x) + P_E(x)$, where $P_O(x) = x^5 + 6x^3 - 2x$ and $P_E(x) = -x^2 + 5$

74. (a)



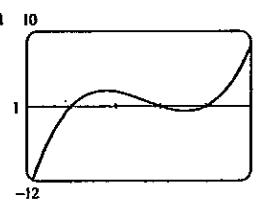
local maximum $(1.8, 2.1)$
local minimum $(3.6, -0.6)$

(b)



local maximum $(1.8, 7.1)$
local minimum $(3.5, 4.4)$

75. (a) Two local extrema



76. (a) Three x -intercepts, two local extrema

(b) One x -intercept, no local extrema

(c) Three x -intercepts, two local extrema; one x -intercept, no local extrema

77. (a) 26 blenders

(b) No; \$3276.22

78. (a) 1380 rabbits, after 4.2 months

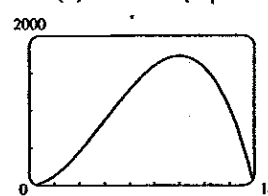
(b) After 8.4 months

79. (a) $V(x) = 4x^3 - 120x^2 + 800x$ (b) $0 < x < 10$

(c) Maximum volume $\approx 1539.6 \text{ cm}^3$



80. (b) Domain $\{x \mid 0 < x < 18\}$ (c) 1728 in^3



Section 3.2 ■ Page 370

1. $(x + 3)(3x - 4) + 8$
2. $(x - 1)(x^2 + 5x - 1)$
3. $(2x - 3)(x^2 - 1) - 3$
4. $(2x + 1)(2x^2 - x + 4) + 5$
5. $(x^2 + 3)(x^2 - x - 3) + (7x + 11)$