pg. 311 # 2-36 even, 15

2. $(x+3)(x+4)(x+5)$

$x^2+7x+12$

x	x^3	$7x^2$	$12x$
$+5$	$5x^2$	$35x$	60

$= \boxed{x^3+12x^2+47x+60}$

8. $9x^3+6x^2-3x$

$3x(3x^2+2x-1)$

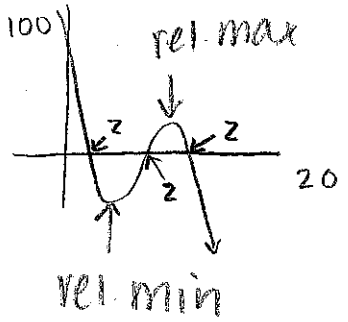
-3, -1, 3, 2

$3x\left(\begin{array}{c|c|c} & x & 1 \\ \hline 3x & 3x^2 & 3x \\ \hline -1 & -x & -1 \end{array}\right)$

$\boxed{3x(3x-1)(x+1)}$

14. Graphing Calculator

* Make window big enough to see y-intercept



because it's cubic and I see 3 roots, I can be sure I'm getting an accurate view of the graph.

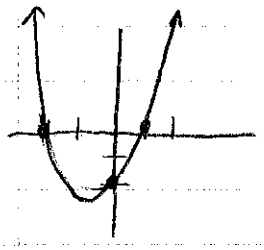
Use 2nd TRACE 2: zero to find the x-ints
Use 2nd TRACE 3: min to find relative min
Use 2nd TRACE 4: max to find relative max

zeros: (2,0) (6,0) (8,0)
rel min: (3.57, -16.9)
rel max: (7.1, 5.05)

just the y-value is the min/max function value

16. $0 = (x-1)(x+2)$
$x = 1 \quad x = -2$

$y = x^2 + x - 2$ ← y-intercept.



22. $x = -2 \quad x = 0 \quad x = 1$
$(x+2) \quad (x) \quad (x-1)$

$x(x+2)(x-1)$

$x(x^2 + x - 2)$

$\boxed{x^3 + x^2 - 2x}$

30. $y = x(x-1)^3$

$(0,0)$

$(3,0)$ multiplicity 3

15a. height = x
length = $16 - 2x$ } flat rectangle minus each corner
width = $12 - 2x$

b. $V = lwh$
$V = (16-2x)(12-2x)x$

c. graphing calculator find rel. max. (2.26, 194.1)
x = height = 2.26 in
y = max volume = 194.1 in^3

Answers for Lesson 6-2, pp. 311–313 Exercises

1. $x^2 + x - 6$

2. $x^3 + 12x^2 + 47x + 60$

3. $x^3 - 7x^2 + 15x - 9$

4. $x^3 + 4x^2 + 4x$

5. $x^3 + 10x^2 + 25x$

6. $x^3 - x$

7. $x(x - 6)(x + 6)$

8. $3x(3x - 1)(x + 1)$

9. $5x(2x^2 - 2x + 3)$

10. $x(x + 5)(x + 2)$

11. $x(x + 4)^2$

12. $x(x - 9)(x + 2)$

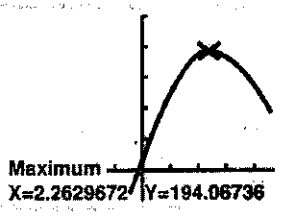
13. 24.2, −1.4, 0, −5, 1

14. 5.0, −16.9, 2, 6, 8

15. a. $h = x$, $\ell = 16 - 2x$, $w = 12 - 2x$

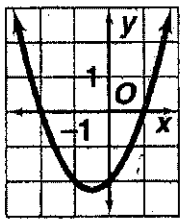
b. $V = x(16 - 2x)(12 - 2x)$

c.

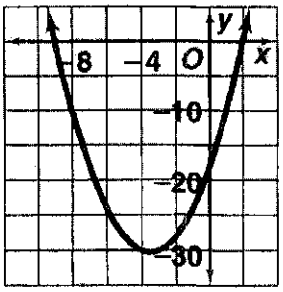


194 in.^{3}, 2.26 in.

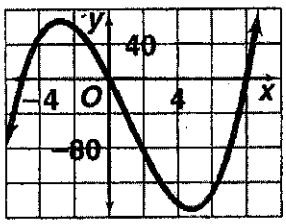
16. 1, −2



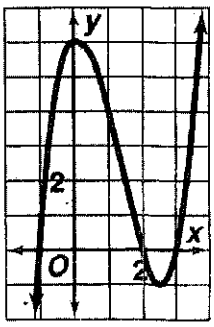
17. 2, −9



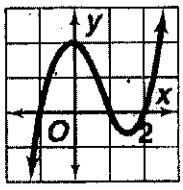
18. 0, −5, 8



19. −1, 2, 3



20. −1, 1, 2



21. $y = x^3 - 18x^2 + 107x - 210$

22. $y = x^3 + x^2 - 2x$

23. $y = x^3 + 9x^2 + 15x - 25$

24. $y = x^3 - 9x^2 + 27x - 27$

25. $y = x^3 + 2x^2 - x - 2$

26. $y = x^3 + 6x^2 + 11x + 6$

27. $y = x^3 - 2x^2$

28. $y = x^3 - \frac{7}{2}x^2 - 2x$

29. -3 (mult. 3)

30. 0, 1 (mult. 3)

31. $-1, 0, \frac{1}{2}$

20

32. $-1, 0, 1$

33. 4 (mult. 2)

34. 1, 2 (mult. 2)

35. $-\frac{3}{2}$, 1 (mult. 2)

36. -1 (mult. 2), 1, 2

37. 2 x^3 blocks, 15 x^2 blocks, 31 x blocks, 12 unit blocks

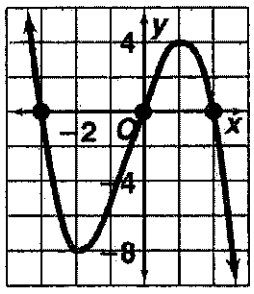
38. **a.** $V = 2x^3 + 15x^2 + 31x + 12$; $2x^3 + 7x^2 + 7x + 2$

b. $V = 8x^2 + 24x + 10$

39. $V = 12x^3 - 27x$

40. **a.** $h = x + 3$; $w = x$

b.



0, -3, 2; where the volume is zero

c. $0 < x < 2$

d. 4.06 ft^3