Lesson 3.1.2

3-13. See below:

a. Explainations vary; $(x + y)^2 = x^2 + 2xy + y^2$.

b. $(x + y)^2 = x^2 + y^2$ only when $x = 0$ or $y = 0$; justifications vary.

3-14. See below:

a. Explanations vary, but should contain the idea that area of a rectangle is the same as the product of its dimensions.

b. $10k^2 - 11k + 3$

c. $(x - 4)(x + 1)$

3-15. See below:

a. $(2x + 1)(x + 2)$

b. $3x^2 - 13x + 6xy - 2y + 4$

c. $x^2 - 9$

d. $(2x - 7)(2x + 7)$

e. $2p^3 + 5p^2 + 15p - 9$

f. $-x^3 + 4x^2 + 2x - 1$

3-16. See below:

a. $2p^3 + p^2 - 3p$

b. $x^2 + 4x - 5$

3-17. See below:

a. $y(x + 3 + y) = xy + 3y + y^2$

b. $(x + 8)(x + 3) = x^2 + 11x + 24$

c. $(5x - 3)(2x - 4y + 5) = 10x^2 - 20xy + 19x + 12y - 15$

d. Possible answers include $(x + 12)(x + 1) = x^2 + 13x + 12$, $(x + 6)(x + 2) = x^2 + 8x + 12$, and $(x + 4)(x + 3) = x^2 + 7x + 12$

3-18. See below:

a. Students should describe the difference of squares, although they may use different words.

b. She has figured out that the difference of squares can be written as a product of the square roots as follows: *i*: $(w + 9)(w - 9)$, *ii*: $(2m + 1)(2m - 1)$, *iii*: $(x + 4y)(x - 4y)$

3-19. See below:

a. Parts (*i*) and (*iii*) are differences of squares. *i*: $a^2 - 4b^2 = (a)^2 - (2b)^2$; *iii*: $-x^2 + y^4 = (y2)^2 - (x)^2$.

b. Expressions vary. Examples include: $16x^2 - 9y^2 = (4x + 3y)(4x - 3y)$ and $x^2 - 81 = (x + 9)(x - 9)$

3-20. See below:

a. Yes; it is the difference of the square of $3xy^2$ and the square of z^3.

b. U represents $3xy^2$ and V represents z^3.

c. Explanations vary.

d. $U^2 - V^2 = (U + V)(U - V)$; $(3xy^2 + z^3)(3xy^2 - z^3)$.

3-21. These can all be expressed in the form $U^2 + 2UV + V^2 = (U + V)^2$.

a. $(a + b)^2$

b. $(x - 3)^2$

c. $(3x + 5y)^2$

d. $((a + 7) - 5)^2$

3-22. See below:

a. Answers will vary.

3-23. See below:

a. not equivalent

b. equivalent

c. equivalent

d. equivalent

e. not equivalent

f. not equivalent

3-24. See below:

a. equal if $x = 0$

b. equal

c. equal

d. equal

e. equal if x = 0 or $x = 1$

f. equal if $a = 1$ or $a = 0$

3-25. See below:

a. Possibilities include: $x - 2 = 4$ or $2x - 4 = 8$

b. They have the solution $x = 6$

c. $3 - x = 7$, $x = -4$

3-26. See below:

a. $t(n) = -3n + 17$, points along a line with y-intercept (0, 17) and slope –3

b. $t(n) = 50(0.8)^n$, points along a decreasing exponential curve with y-intercept (0, 50)

3-27. See below:

a. 4

b. –30

c. 12

d. $-2\frac{1}{4}$

e. $x = -4,\ \frac{1}{3}$

3-28. (0, 0) and (–6, 0)

3-29. See below:

a. $2x^2 + 6x$

b. $x^2 - 2x - 15$

c. $2x^2 - 5x - 3$

d. $x^2 + 6x + 9$

3-30. The first graph opens downward, is stretched, and has its vertex at (–1, –3). The second is the parent graph.

3-31. See below:

a. (1, –4)

b. (1, –4)

c. (–2.5, –4.25)

d. Domain: $-\infty < x < \infty$, Range: $y \geq -4.25$

3-32. See below:

a. $\frac{y^8}{x^{12}}$

b. $-18x^3y + 6x^5y^2z$

3-33. See below:

a. odd

b. even

c. even

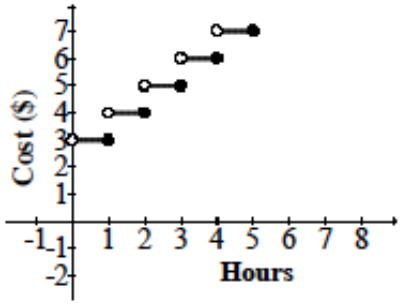
3-34. See below:

a. $4.00

b. $4.00

c. $4.00. $5.00

d. See graph below.



e. No, it is a step function.

f. The graph will shift (translate) upward by $2.00.

3-35. See below:

a. $(x + 2)^2 + (y - 13)^2 = 144$

b. $(x + 1)^2 + (y + 4)^2 = 1$

c. $(x - 3)^2 + (y + 8)^2 = 16$

3-36. See below:

a. 24 blocks per hour

b. 18 blocks per hour

c. 14.4 blocks per hour