6. a. A square with side length s, each of which is $\frac{1}{4}$ the length of the perimeter.
b. 25 by 25 with area of 625 square meters
c. 2.5 by 2.5 with area of 6.25 square meters
d. 0.25 by 0.25 with area of 0.0625 square meters
e. 0.025 by 0.025 with area of 0.000625 square meters

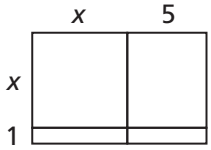
7. $A = (\ell)(150 - \ell)$

8. a. 16
b. 2 by 6
c. 4 by 4; 16

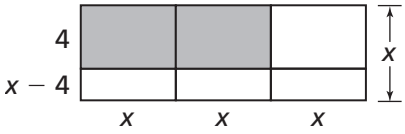
Investigation 2 Additional Practice

1. a. $x(x + 17) = x^2 + 17x$
b. $x(2x) = 2x^2$ or $x(x + x)$
c. $x(x) + x(17) = x^2 + 17x$ or $x(x + 17)$
d. $x(x + 17) - 2x^2 = 17x - x^2$
e. $8x + 34$ or an equivalent expression
f. $2x(2x + 17)$ or an equivalent expression

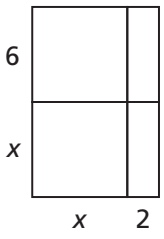
2. $x^2 + 6x + 5$



3. $3x^2 - 12x$



4. $x^2 + 8x + 12$



5. $(x + 9)(x + 2)$
6. $x(x + 4)$
7. $(x + 6)(x + 6) = (x + 6)^2$
8. $(x + 2)(x + 7)$
9. $(x + 3)(x + 4)$
10. $(x + 3)(x + 9)$

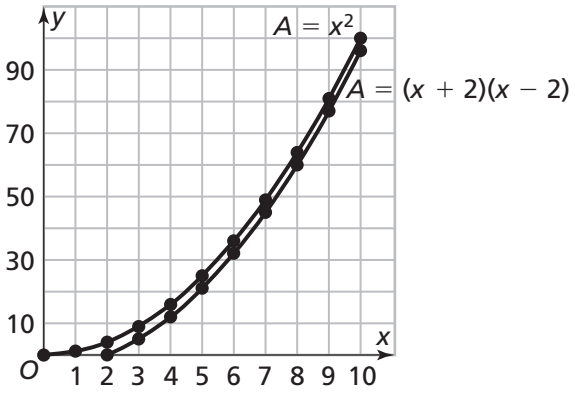
11. a. $3x$
b. $x(x - 3)$
c. $2x + 6 = 2(x + 3)$
d. $2x + 2(x - 3) = 4x - 6$
e. i. Since perimeter is $4x = 36$, then $x = 9$. Thus $3 \times 9 = 27$ square feet
ii. $9 \times (9 - 3) = 54$ square feet
iii. $2(9) + 2(9 - 3) = 30$ feet

12. a.

x	Area of Square	Area of Rectangle
0	$0 \times 0 = 0$	$2 \times -2 = -4$: not possible
1	$1 \times 1 = 1$	$3 \times -1 = -3$: not possible
2	$2 \times 2 = 4$	$4 \times 0 = 0$
3	$3 \times 3 = 9$	$5 \times 1 = 5$
4	$4 \times 4 = 16$	$6 \times 2 = 12$
5	$5 \times 5 = 25$	$7 \times 3 = 21$
6	$6 \times 6 = 36$	$8 \times 4 = 32$
7	$7 \times 7 = 49$	$9 \times 5 = 45$
8	$8 \times 8 = 64$	$10 \times 6 = 60$
9	$9 \times 9 = 81$	$11 \times 7 = 77$
10	$10 \times 10 = 100$	$12 \times 8 = 96$

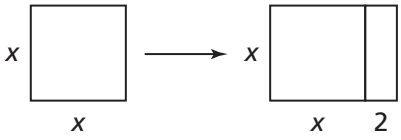
b. The values of x for which the areas are negative or zero such as $x = 0, x = 1$, and $x = 2$.

c.



d. $A = x^2$ and $A = (x + 2)(x - 2)$ or $A = x^2 - 4$.

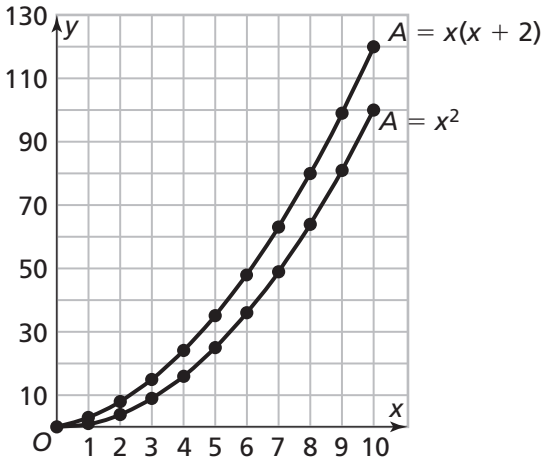
13. a.



b.

x	Area of Square	Area of Rectangle
0	0	0
1	1	3
2	4	8
3	9	15
4	16	24
5	25	35
6	36	48
7	49	63
8	64	80
9	81	99
10	100	120

c.



d. $A = x^2$ and $A = (x + 2)(x) = x^2 + 2x$

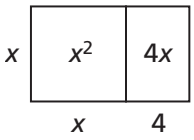
14. $x(x + 2) = x^2 + 2x$

15. $x(x - 1) = x^2 - x$

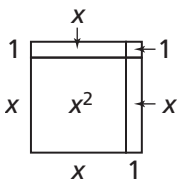
16. $(x + 3)(x + 3) = x^2 + 3x + 3x + 9$ or $x^2 + 6x + 9$

17. Factored form: $(x + 3)(x + x + 2)$ or $(x + 3)(2x + 2)$; Expanded form: $2x^2 + 6x + 2x + 6 = 2x^2 + 8x + 6$

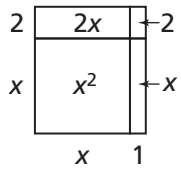
18. $x(x + 4)$



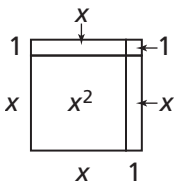
19. $(x + 1)(x + 1) = (x + 1)^2$



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



21. $(x + 1)(x + 1)$



22. The area of region D is $5x$.
The perimeter of region D is $10 + 2x$.
The combined area of regions A, B, C, and D is $2x^2 + 10x$.
The difference of the areas of regions C and D is 0.

23. a. Possible answer: $(x + 2)(x + 4)$; accept the factors in either order

b. Possible answer: $(x + 3)(x + 5)$; accept the factors in either order

c. Possible answer: $(x + 2)(x + 6)$; accept the factors in either order

d. $(x)(x + 6)$

e. Possible answer: $(x + 3)(x + 8)$; accept the factors in either order

24. a. $(1 + x)(3 + x)$

b. 6 by 8

Frogs, Fleas, and Painted Cubes Answers

Skill: Writing Expressions in Expanded Form

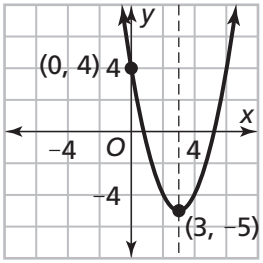
1. $2y^2 + 8y$
2. $2x^2 + 4x + 2$
3. $4n^2 + 8n + 3$
4. $x^2 + 2x$
5. $3b^2 - 15b$
6. $2x^3 + 18x^2$
7. $2a^2 + 16a + 2$
8. $8x^3 + 2x^2$
9. $3l^3 + 12l^2 - 18l$
10. $x^2 + 5x + 6$
11. $x^2 + 6x + 5$
12. $x^2 + 9x + 20$
13. $x^2 + 9x + 14$
14. $x^2 - 5x - 6$
15. $x^2 + 5x - 24$

Skill: Factoring Expressions

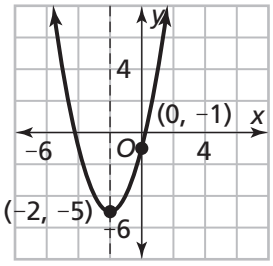
1. $(x + 4)(x + 4)$
2. $(d + 7)(d + 1)$
3. $(y + 4)(y + 2)$
4. $(b - 3)(b + 1)$
5. $(s - 5)(s + 1)$
6. $(x + 8)(x + 4)$
7. $(x - 4)(x - 5)$
8. $(x - 2)(x - 3)$
9. $(a + 2)(a + 1)$
10. $(p - 7)(p - 1)$
11. $(d + 1)(d + 5)$
12. $(n + 3)(n - 2)$
13. $(x - 2)(a + 2)$
14. $(3 + a)(x + y)$
15. $(m - k)(x - 3)$

Skill: Graphs of Parabolas

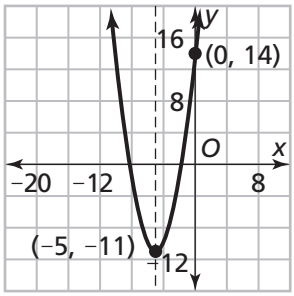
1.



2.



3.



Investigation 3 Additional Practice

1. **a.** 65, 96
   b. From one rectangular pattern to the next, the height increases by 1 and the width increases by 3.
   c. 133, 176
   d. $c = (n + 1)(3n + 1)$; The first three numbers predicted by this equation are 8, 21, 40.
2. **a.** 84, 75
   b. The shaded square is enlarged by 1 unit on each side, from one grid to the next.
   c. 64, 51
   d. $c = 100 - n^2$, where c is the nth number in the sequence; The first three numbers predicted by this equation are $100 - 1^2 = 99$, $100 - 2^2 = 96$ and $100 - 3^2 = 91$.
   e. There are 10 numbers in the sequence.
3. **a.** $7 \times 9 = 63$ and $8 \times 10 = 80$
   b. multiply n by two more than n
   c. $n(n + 2)$