

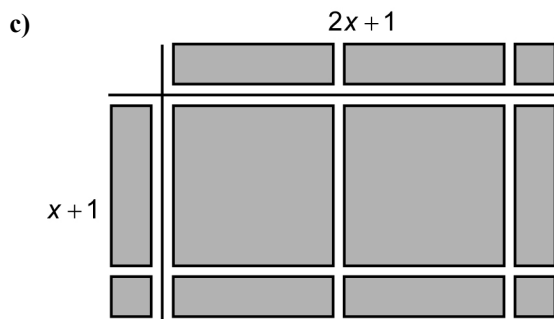
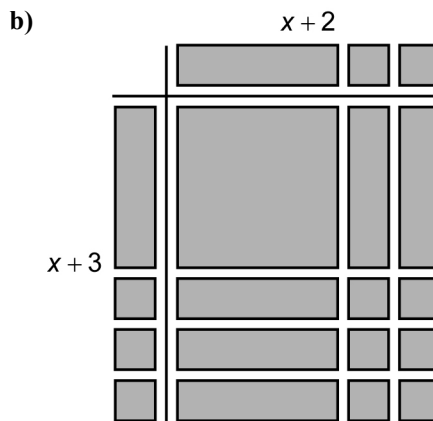
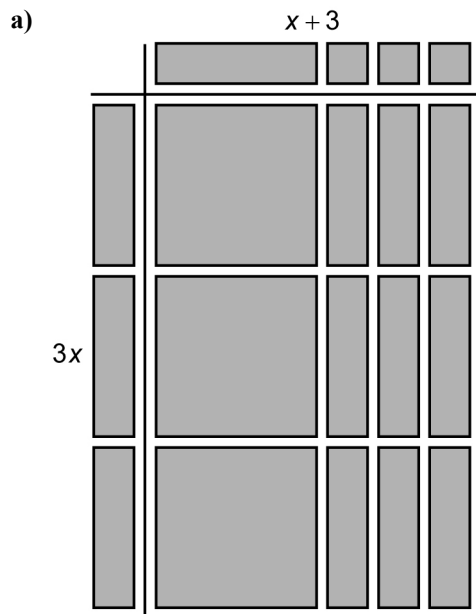
BLM Answers

Get Ready

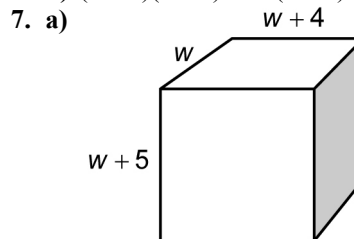
- a) monomial b) trinomial
 c) trinomial d) binomial
 e) four-term polynomial
- a) 2 b) 1 c) 3 d) 5
- a) $6x + 1$ b) $8a - 5b$
 c) $x^2 + 7x - 5$ d) $6y^3 - 9y^2 + 5$
- a) $14x^2 - 2xy - 5y^2$ b) $-ab^2 + 15a - 2b^2$
 c) $8x - 17$ d) $-11b^2 - b - 2$
- a) $2x^2 + 2xy$ b) $-48a^2 + 32a$
 c) $-6a - 42$ d) $6x^2 + 4x + 8$
- a) $12m^2 - 24m$ b) $-16x^2y + 8xy^2$
 c) $-18a^3 - 24a^3b$ d) $-2ab^2 + 12a^2b - 14a$
- a) $30x^3 + 20x^2$ b) $62x^2 + 28x$
- a) 1, 2, 3, 6 b) 1, 2, 17, 34
 c) 1, 17 d) 1, 2, 4, 11, 22, 44
- a) $2 \times 2 \times 3$ b) 3×3
 c) $2 \times 2 \times 2 \times 5$ d) 5×11

Section 5.1 Practice Master

- a) $(x + 1)(x + 3)$ b) $(x + 2)(x + 2)$
- Diagrams may vary. For example:



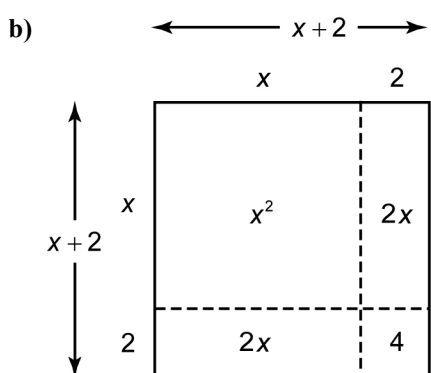
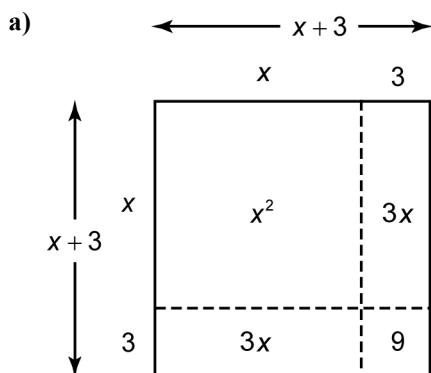
- a) $x^2 + x - 6$ b) $y^2 + 8y + 12$
 c) $n^2 - n - 20$ d) $d^2 + 13d + 42$
 e) $x^2 - 14x + 48$ f) $a^2 - 9a + 18$
- a) $x^2 - 4y^2$ b) $2x^2 - 5x - 3$
 c) $k^2 + k - 42$ d) $4p^2 - 24pq + 35q^2$
 e) $6 - 13s + 6s^2$ f) $6t^2 + rt - r^2$
- a) $4x^2 - 26x - 14$ b) $x^2 + 7x + 16$
 c) $29x^2 + 10x - 9$ d) $-8m^2 - 16m$
 e) $23m^2 - 26m - 9$ f) $-24x^2 - 120x + 21$
- a) $2x(3x + 1) + 2x(2x + 2 - 2x) = 6x^2 + 6x$
 b) $(x + 6)(x - 3) - 2x(x + 1) = -x^2 + x - 18$



- b) $x^3 + 9x^2 + 20x$ c) $6x^2 + 36x + 40$

Section 5.2 Practice Master

1. Diagrams may vary. For example:



2. a) $x^2 + 8x + 16$ b) $y^2 + 14y + 49$
c) $a^2 + 16a + 64$ d) $q^2 + 10q + 25$
3. a) $6y^2 + 36y + 36$ b) $6x^2 + 12xy + 4y^2$
c) $4x^2 + 4xy + y^2$ d) $36c^2 + 84cd + 49d^2$
4. a) $x^2 - 12x + 36$ b) $b^2 - 50b + 625$
c) $r^2 - 22r + 121$ d) $e^2 - 14e + 49$
5. a) $64a^2 - 16a + 1$ b) $4u^2 - 12uv + 9v^2$
c) $36p^2 - 84p + 49$ d) $25q^2 - 80qr + 64r^2$
6. a) $v^2 - 4$ b) $x^2 - 36$
c) $x^2 - y^2$ d) $r^2 - s^2$
7. a) $36g^2 - 49h^2$ b) $9x^2 - y^2$
c) $g^2 - 81x^2$ d) $16x^2 - 25y^2$
8. a) $V = x^3 + 3x^2y + 3xy^2 + y^3$
b) $SA = 6x^2 + 12xy + 6y^2$
9. a) $(3, 0)$ b) $y = x^2 - 6x + 9$

c) Substitute the coordinates into the left and right sides of the equation.

$$\begin{aligned} \text{L.S.} &= x^2 - 6x + 9 & \text{R.S.} &= y \\ &= 3^2 - 6(3) + 9 & &= 0 \\ &= 9 - 18 + 9 & & \\ &= 0 & & \end{aligned}$$

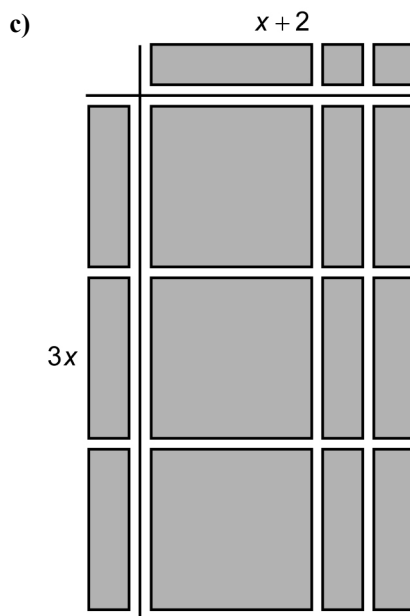
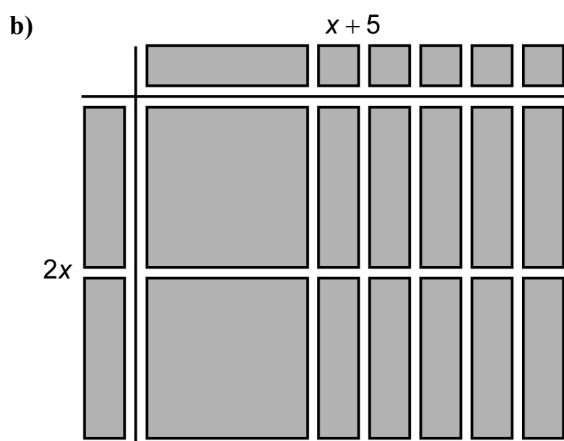
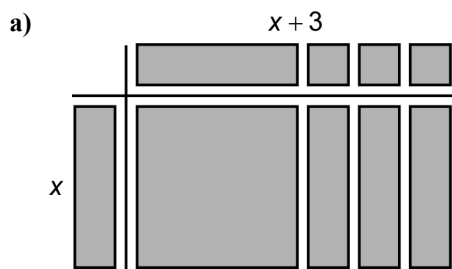
$$\text{L.S.} = \text{R.S.}$$

10. the square, by 9 cm^2

11. a) $16x^4 + 24x^2y^2 + 9y^4$ b) $9x^4 - 4y^4$
c) $-6x + 18$ d) $13b^2 - 6b + 6$
e) $9x^4 + 30x^3 - 19x^2 - 10x + 1$
f) $8x^3 - 36x^2 + 54x - 27$

Section 5.3 Practice Master

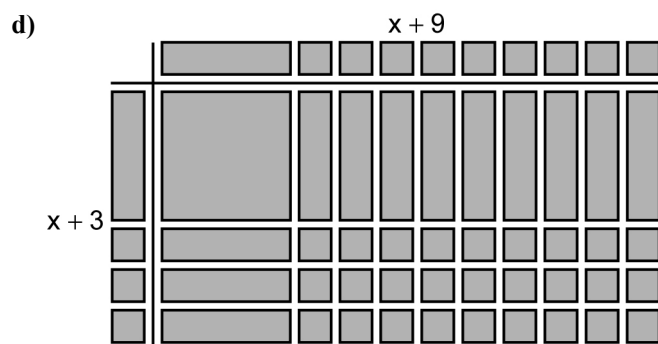
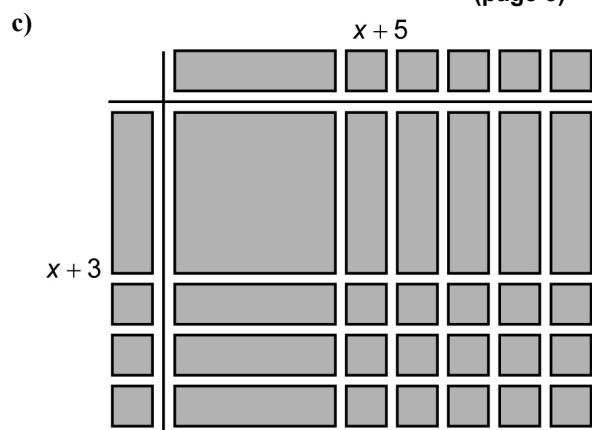
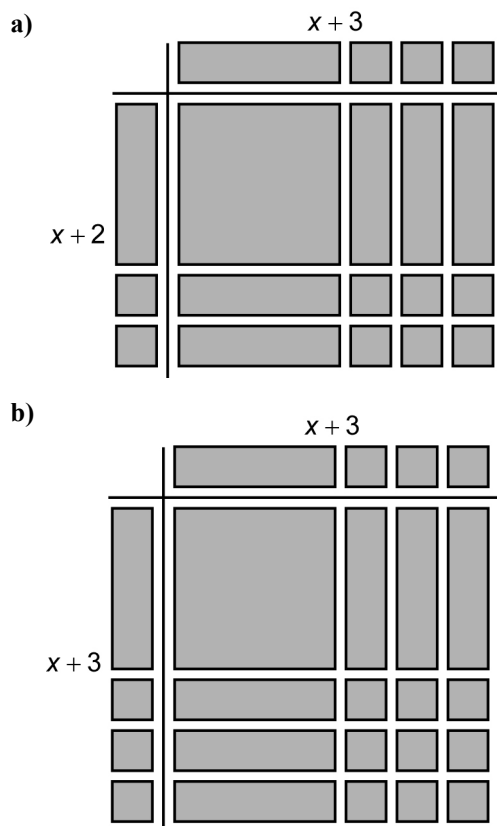
1. Diagrams may vary. For example:



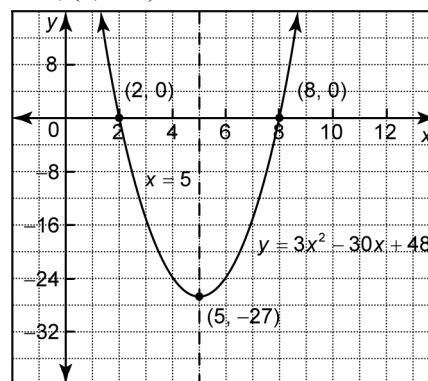
2. a) $3(x + 2y)$ b) $17a(c - 2d)$
 c) $8xy(2xy - 3)$ d) $9xy(3x^2y^2 + 2xy + 1)$
 e) $6np^2(n + 2 + 6n^2p)$ f) $11c^2de(3c^2d^2e - 1)$
 g) $3(g^2 + 2g + 3)$
3. a) $(x + 7)(2x + 3)$ b) $(b - 7)(a + 2)$
 c) $(r + u)(4s - 3)$ d) $(x + s)(y + z)$
4. a) $(a + 3)(x + y)$ b) $2(x + 2)(2x + 3y)$
 c) $(y + 3)(y + a)$ d) $(5x + 1)(5x + 3y)$
5. a) $SA = 2(lw + lh + wh)$
 b) Both formulas give 340 cm^2 because the formulas are equivalent.
6. a) $-(y - 6)(3x - 2)$ b) $2(x - 3)(y - 2z)$
7. a) $\frac{5}{2}xy(9x - 2)$ b) $r^2(\pi - 2)$

Section 5.4 Practice Master

1. Diagrams may vary. For example:



2. a) 6, 8 b) -3, 5 c) -6, 5 d) -2, -1
3. a) $(x + 6)(x + 2)$ b) $(c - 6)(c + 3)$
 c) $(d + 3)(d + 7)$ d) $(d - 5)(d - 7)$
 e) not possible f) $(c - 5)(c - 6)$
 g) $(y + 7)(y + 8)$ h) $(x - 9)(x + 8)$
4. a) $3(x - 6)(x + 2)$ b) $-2(x - 2)(x + 1)$
 c) $6(x - 4)(x - 3)$ d) $-3(x + 2)(x + 4)$
 e) $4(x - 7)(x - 3)$ f) $x(x + 3)(x + 4)$
5. Answers may vary. For example:
 a) $b = 8, b = -8$ b) $b = 9, b = -9$
 c) $b = 2, b = -2$ d) $b = 3, b = 7$
6. Answers may vary. For example:
 a) $c = 3, c = -5$ b) $c = -10, c = 8$
7. a) $3(x - 8)(x - 2)$ b) 2, 8
 c) $x = 5, (5, -27)$



8. x by $x + 2$ by $x + 3$

Section 5.5 Practice Master

- a) $(x+3)(2x+1)$ b) $(2x+1)(3x+4)$
 c) $(x+2)(3x+1)$ d) $2(x+2)(2x+5)$
- a) $2(x+2)(3x-1)$ b) $(7x-2)(8x+1)$
 c) $(3x+1)(3x+1)$ d) $2(2c+1)(3c-8)$
 e) $(d-6)(2d+1)$ f) $(r+4)(2r+5)$
 g) $(2s-5)(3s-7)$ h) $(3r-2)(5r+1)$
 i) $(2r-5)(2r-5)$ j) $(x-4)(13x-5)$
- a) $(2x+y)(3x-4y)$ b) $(3x+2y)(3x+2y)$
 c) $(3r-2s)(4r+5s)$ d) $(3r-4s)(5r-s)$
 e) $(x-6y)(2x-7y)$ f) $(3y+4x)(6y-x)$
- Answers may vary. For example:
 a) $k=26, k=-29$ b) $k=16, k=-17$
 c) $k=5, k=-7$ d) $k=9, k=-11$
- a) length $3x+1$, width $2x-7$
 b) length 46 m, width 23 m
- a) $-0.005(x-100)(x+2)$ b) 100 m
- a) $10x+3, x-1$ b) 53 m; 49 m
- a) $(2x^2-3)(5x^2+6)$ b) $(5x^3-6y^2)(4x^3-7y^2)$

Section 5.6 Practice Master

- a) $(x-5)(x+5)$ b) $(y-7)(y+7)$
 c) $(3k-1)(3k+1)$ d) $(4k-7)(4k+7)$
 e) $(5w-6)(5w+6)$ f) $(2-3w)(2+3w)$
- a) $(x-y)(x+y)$ b) $(6x-y)(6x+y)$
 c) $(5r-6s)(5r+6s)$ d) $(12r-7s)(12r+7s)$
 e) $(11x-3y)(11x+3y)$ f) $(10r-9s)(10r+9s)$
- a) $(x+7)^2$ b) $(x-3)^2$
 c) $(x-4)^2$ d) $(10-x)^2$
 e) $(2x-3y)^2$ f) $(7x+4y)^2$
- a) $2(a+3)^2$ b) not possible
 c) $3(5x+7y)^2$ d) $xy(3x-4y)(3x+4y)$
 e) $4(3m-4n)^2$ f) $5(2x+y)^2$
- a) $b=25$ b) $b=84$ or $b=-84$
- Answers may vary, but k must be a perfect square.
 For example:
 a) $k=25, k=4$ b) $k=9, k=81$
- a) $(3c+2)(7c+4)^2$ b) not possible
 c) not possible d) $25(xy-3ab)^2$
- $y=4(x+4)^2; (-4, 0)$
- $A=4(x+3)(2x+1)$

Chapter 5 Review

- a) $x^2+10x+21$ b) $y^2+2y-15$
 c) $x^2-xy-6y^2$ d) $15a^2+58ab+48b^2$
- a) $-4a^2-12a+72$ b) $-3x^3-24x^2y-36xy^2$
 c) $29y^2+90y+50$ d) $19b^3+2b^2-16b$
 e) $-2x^3-6x^2y+xy^2+y^3$

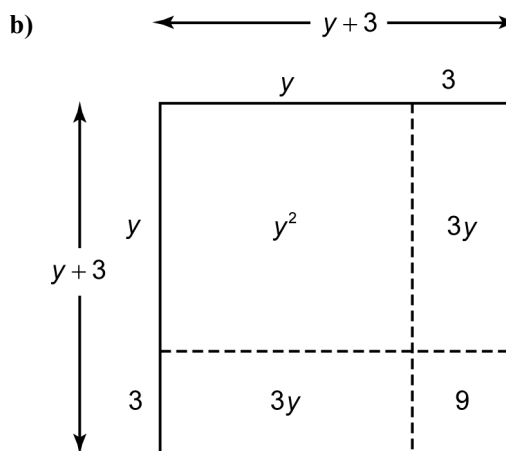
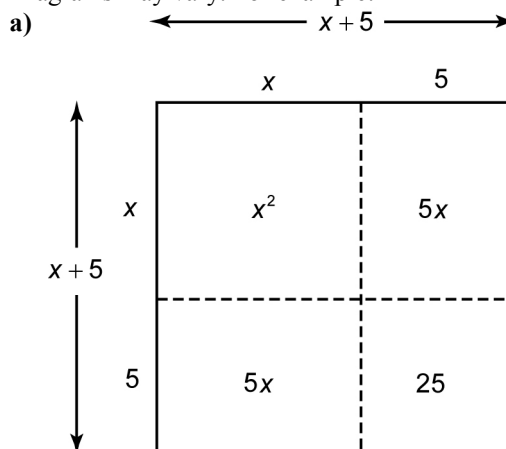
- a) $y=2x^2-18x+36$ b) 3, 6
 c) Substitute the coordinates of the points at the x -intercepts into both sides of the equation.

$$\begin{aligned} \text{L.S.} &= y & \text{R.S.} &= 2x^2 - 18x + 36 \\ &= 0 & &= 2(6)^2 - 18(6) + 36 \\ & & &= 72 - 108 + 36 \\ & & &= 0 \end{aligned}$$

$$\text{L.S.} = \text{R.S.}$$

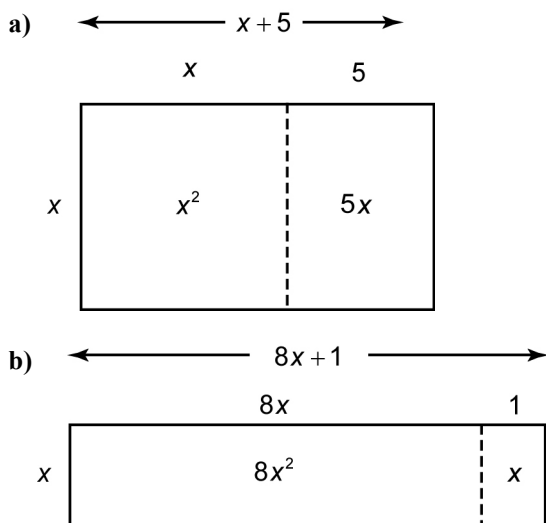
- a) $(x-3)(x+9)-9(x-5)$ b) $x^2-3x+18$

- Diagrams may vary. For example:

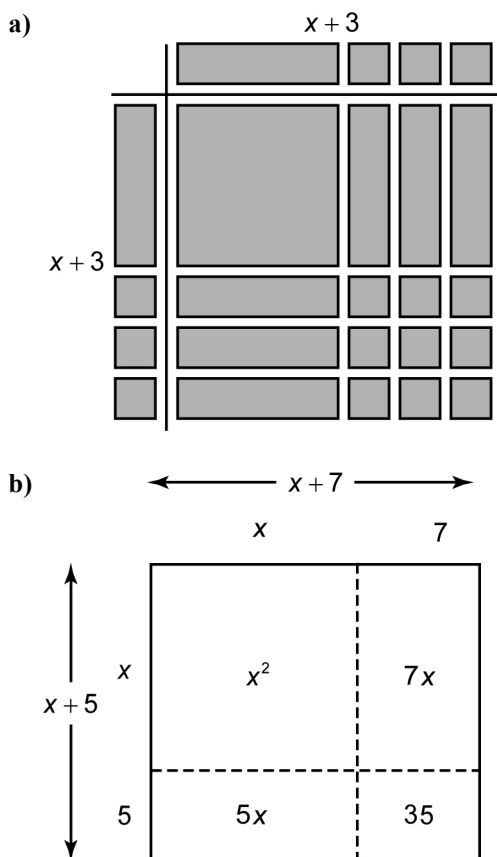


- a) $x^2+12x+36$ b) r^2-6r+9
 c) $y^2+20y+100$ d) $e^2-10e+25$
- a) b^2-81 b) y^2-121
 c) m^2-169 d) $196-x^2$
- a) $x^2-6xy+9y^2$ b) $-20x^2-100xb-125b^2$
 c) $121x^2-169y^2$ d) $36b^2-a^2$
- a) $(4a+6)(4a-6)$ b) $16a^2-36$
 c) $(4a)(4a)-(16a^2-36)=36$ d) 364 cm^2

10. Diagrams may vary. For example:



11. a) $2x(x+2)$ b) $x(5x+3)$
 c) $10(x^2+2y^2)$ d) $x(3y-7z)$
 12. a) $(x+1)(2x+3y)$ b) $(x+y)(x^2+y)$
 c) $(5a+3)(b-1)$ d) $(3a^2+b^2)(x+y)$
 13. a) $(x+y)(2z+3xy)$ b) not possible
 c) $3(2a+1)(a^2+2)$ d) $xz(xyz-xz+y)$
 14. $xy(2x+5)$
 15. Diagrams may vary. For example:



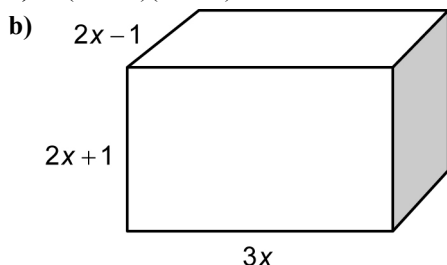
16. a) $(x-6)(x+2)$ b) $(x-3)(x-4)$
 c) $(x-9)(x+5)$ d) $(x+2)(x+7)$
 17. a) $-2(x-5)(x-3)$ b) $x(x+7)(x-4)$
 18. length $x-9$, width $x-10$; length 2 cm, width 1 cm
 19. a) $(3x+1)(4x-3)$ b) $(x-5)(3x+2)$
 c) $(2x-1)(5x+7)$ d) $(3x+1)(7x-1)$
 20. a) $3(x^2+5y+11)$ b) not possible
 c) $3(2x-1)(5x+4)$ d) $-2(x+6)(3x-1)$
 21. Answers may vary. For example:
 a) $k=-7$ b) $k=13$
 22. a) $(x-10)(x+10)$ b) $(c-5)(c+5)$
 c) $(3x-4)(3x+4)$ d) $2(8-3x)(8+3x)$
 e) $(1-15y)(1+15y)$ f) $-3(x-3y)(x+3y)$
 23. a) Since $y^2 = (y)^2$ and $64 = 8^2$, the first and last terms are perfect squares. Since $16y = 2(y)(8)$, the middle term is twice the product of the square roots of the first and last terms. Therefore, $y^2 + 16y + 64$ is a perfect square trinomial.
 $(y+8)^2$
 b) Since $x^2 = (x)^2$ and $100 = (-10)^2$, the first and last terms are perfect squares. Since $-20x = 2(x)(-10)$, the middle term is twice the product of the square roots of the first and last terms. Therefore, $x^2 - 20x + 100$ is a perfect square trinomial.
 $(x-10)^2$
 c) Since $225 = (15)^2$ and $9y^2 = (-3y)^2$, the first and last terms are perfect squares. Since $-90y = 2(15)(-3y)$, the middle term is twice the product of the square roots of the first and last terms. Therefore, $225 - 90y + 9y^2$ is a perfect square trinomial.
 $(15-3y)^2$
 This is not fully factored:
 $(15-3y)^2 = [3(5-y)]^2 = 9(5-y)^2$
 d) Since $121c^2 = (11c)^2$ and $196d^2 = (14d)^2$, the first and last terms are perfect squares. Since $308cd = 2(11c)(14d)$, the middle term is twice the product of the square roots of the first and last terms. Therefore, $121c^2 + 308cd + 196d^2$ is a perfect square trinomial.
 $(11c+14d)^2$

24. a) not possible b) $2(5x-3y)^2$
 c) $(x+y-7)(x-y+1)$ d) not possible
 25. a) x by $2x+3$ by $2x+3$
 b) two congruent squares and four congruent rectangles
 c) 243 cm^3 d) 270 cm^2

Chapter 5 Practice Test

1. a) $(x+3)(x+2)$ b) $(2x+1)(x+4)$
 2. a) $-8x^5 - 4x^4 - 8x^3$ b) $-8x^3y - x^2y^2 - 9xy$
 3. a) $x^2 - 12x + 27$ b) $4x^2 + 4x - 3$
 c) $-x^2 + 24x - 66$ d) $11c^2 + 4cd + d^2$
 e) $-10x^2 - 2x + 9$ f) $c^2 + 12cd - 6c + 9d^2 - 3$
 4. k must be divisible by 2, because the only common factor of the other two coefficients is 2.

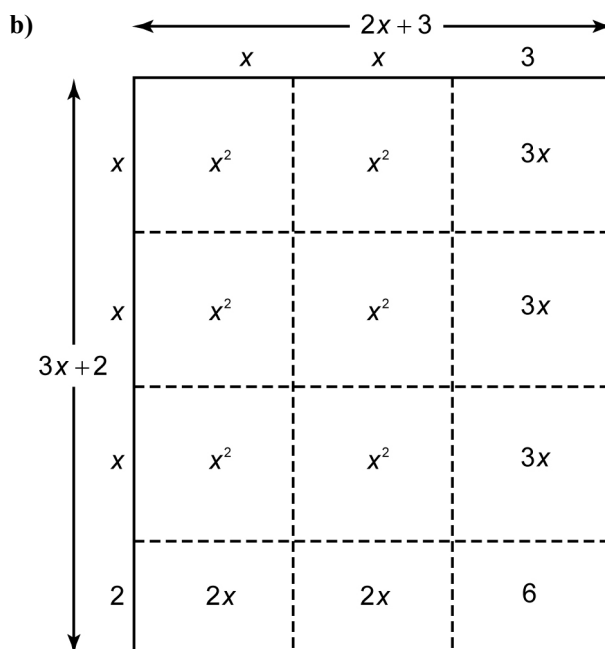
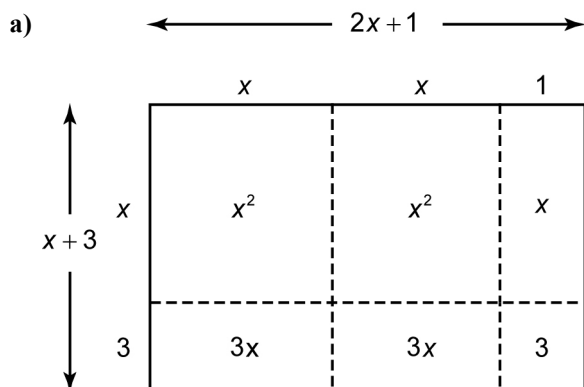
5. a) $x^2(3x+1)(2x+5)$ b) $6x^4 + 17x^3 + 5x^2$
 c) 252 cubic units
 6. a) $(x+5)^2$ b) $(5r-2s)^2$
 c) $5(x-1)(x+1)$ d) $(1-7m)(1+7m)$
 e) $(m+3)(5m+2)$ f) $(m-2n)(m-7n)$
 7. a) $y(y-2)(3y-1)$ b) $4(m^2+4)$
 c) $(2y+1)(3y-1)$ d) $(m-2)(x-4)$
 e) $(x+y)(y+2)$ f) $t(3-2t)(3+2t)$
 8. a) $-5(t-5)(t+1)$ b) after 5 s c) 45 m
 9. Answers may vary. For example:
 a) $k = -12, k = 13$ b) $k = 5, k = 4$ c) $k = 84, k = 85$
 d) $k = 1, k = 169$ (k must be a perfect square)
 10. $\pi(r+3)^2 - \pi r^2 = 3\pi(2r+3)$
 11. a) $3x(2x-1)(2x+1)$



- c) 18 cm by 11 cm by 13 cm
 12. a) $(2x+5)(5x-8)$ b) 69 mm by 152 mm
 13. First, remove the greatest common factor, x , to get $x(ax^2 + bx + c)$. Then, find two integers, m and n , whose product is ac and whose sum is b . Break up the middle term, bx , into $mx + nx$ and then factor by grouping.
 14. a) $23^2 - 22^2 = (23-22)(23+22)$
 $= 1(55)$
 $= 55$
 b) $25^2 - 23^2 = (25-23)(25+23)$
 $= 2(48)$
 $= 96$
 c) $81^2 - 77^2 = (81-77)(81+77)$
 $= 4(158)$
 $= 632$
 d) $154^2 - 150^2 = (154-150)(154+150)$
 $= 4(204)$
 $= 816$
 15. a) You can write any two numbers that differ by 2 as $x-1$ and $x+1$. Their average is $\frac{x-1+x+1}{2} = \frac{2x}{2} = x$. Their product is $(x-1)(x+1)$, or $x^2 - 1$.
 b) Find the square of their average and subtract 4.
 c) Write the two numbers as $x-2$ and $x+2$. Their average is x . Their product is $(x-2)(x+2)$, or $x^2 - 4$.

Chapter 5 Test

1. Diagrams may vary. For example:



2. a) $3x^3y^3 + 12x^3y^2 - 6x^2y^3$ b) $x^2 - 32x + 44$
 3. a) $k^2 + 3k - 4$ b) $6x^2 - 31x + 5$
 c) $15x^2 - 36x + 23$ d) $4x^2 - 14xy + 11y^2$
 e) $-14x^2 + 22x - 26$
 4. a) $(5x+3)^2 = 25x^2 + 30x + 9$ b) 1444 cm^2
 5. a) $2x(5x-2)(3x+4)$
 b) $30x^2 + 28x^2 - 16x$
 c) 42 cm^3
 6. a) $(x-5)^2$ b) $(2x-3)^2$
 c) $(y+2)(2y+1)$ d) $(k-4)(3k+1)$
 e) $(2r-1)(5r+3)$ f) $(2s-5t)(3s+2t)$
 7. a) $21(x-1)(x+2)$ b) $7(g-3)(g+7)$
 c) not possible d) $c(c-3)(c+3)$
 e) $(2d-3)(3d-2)$ f) $2(5x-6)(5x+6)$
 8. a) 150 m b) $-5(t-5)(t+6)$ c) after 5 s
 9. a) $3x-2$ b) 220 m

10. a) $k = 36$ b) $k = -30, k = 30$
c) $k = 4$ d) $k = -24, k = 24$
e) $k = -12, k = 12$ f) $k = 36$
g) $k = -84, k = 84$ h) $k = 9$
11. $(2x + 3)(x + 4) - x^2 = x^2 + 11x + 12$
12. a) $(2x - 1)(3x + 4)$
b) $10x + 6$
c) $325 \text{ cm}^2, 76 \text{ cm}$
13. Multiply the square root of 100, -10 or 10 , by 2, to get -20 or 20 .
14. There are eight possible answers for the ordered pair (a, b) : $(5, 2)$, $(-5, 2)$, $(5, -2)$, $(-5, -2)$, $(11, 10)$, $(-11, 10)$, $(11, -10)$, and $(-11, -10)$.
15. a) $(2x + 3)(2x + 3) - (2)(2)$
b) $(2x + 1)(2x + 5)$
c) 77 cm^2