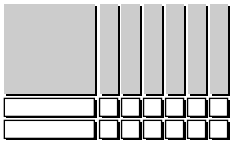
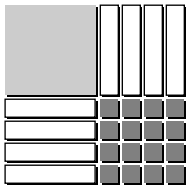
Chapter 5 Review

1. a)



b)



2. a) $a^2 + 12a + 35$
b) $y^2 - 64$
c) $10v^2 + 32vw + 24w^2$
d) $4c^2 - 1$
e) $-2r^2 + 18s^2$
f) $-g^2 - 8gh - 16h^2$

3. a) $r^3 - 3r^2 - 36r - 32$
b) $-48p^3 + 121p^2 + 185p$; solution:

$$\begin{aligned}
&3p(4p - 5)(p - 7) - 5p(6p + 2)(2p - 8)\\
&= 3p[4p(p - 7) - 5(p - 7)] -\\
&\quad 5p[6p(2p - 8) + 2(2p - 8)]\\
&= 3p\,(4p^2 - 28p - 5p + 35) - 5p(12p^2 -\\
&\quad 48p + 4p - 16)\\
&= 12p^3 - 84p^2 - 15p^2 + 105p - 60p^3 +\\
&\quad 240p^2 - 20p^2 + 80p\\
&= (12 - 60)p^3 + (-84 - 15 + 240)p^2 +\\
&\quad (105 + 80)p\\
&= -48p^3 + 121p^2 + 185p
\end{aligned}$$

4. $2a^2 + 5ab + 2a - 2b + 2b^2$; solution:
From the diagram it can be seen that the area of the figure is equal to the area of the original square less the area of the rectangular shape that is removed.

$$\begin{aligned}
\text{Area of square} &= (2a + b)^2\\
&= 2a(2a + b) + b(2a + b)\\
&= 4a^2 + 2ab + 2ab + b^2\\
&= 4a^2 + 4ab + b^2
\end{aligned}$$

Area of rectangular shape

$$\begin{aligned}
&= (a - b)(2a + b - 2)\\
&= a(2a + b - 2) - b(2a + b - 2)\\
&= 2a^2 + ab - 2a - 2ab - b^2 + 2b\\
&= 2a^2 - ab - 2a + 2b - b^2
\end{aligned}$$

$$\begin{aligned}
\text{Area of figure} &= (4a^2 + 4ab + b^2) - (2a^2\\
&\quad - ab - 2a + 2b - b^2)\\
&= 4a^2 + 4ab + b^2 - 2a^2 +\\
&\quad ab + 2a - 2b + b^2\\
&= 2a^2 + 5ab + 2a - 2b + 2b^2
\end{aligned}$$

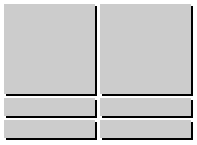
5. $2x^2 - 30x + 100$

6. a) 15 **b)** 28
c) 18 **d)** $2d$
e) $17ab$ **f)** $5rst$

7. a) 75 **b)** 128

8. a) 9 **b)** 13
c) $4ab$ **d)** $12xy^2z$
e) m^3n^5

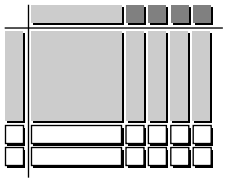
9. a) $2x(x + 2)$



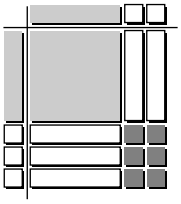
b) $x(x + 3)$

10. $a^2 + 2ab + 3a + 2b - 2$

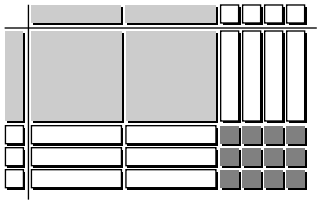
11. a)



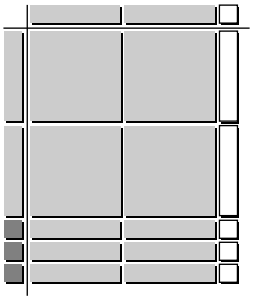
b)



c)



d)



12. a) $(x - 4)(x - 2)$
b) $(x - 5)(x + 4)$
c) $(3x + 1)(3x - 5)$
d) not possible
e) $-3(x - 3)(2x - 9)$
f) $-2x(2x + 1)(3x - 2)$

13. x, $x + 1$, $x - 3$; 5 cm by 6 cm by 2 cm

14. a) $9x^2 - 42x + 49 = (3x - 7)^2$, so the side length of the field is $3x - 7$ and the perimeter is $4(3x - 7) = 12x - 28$.
b) The length of the fence that borders the field is $12(20) - 28 = 212$ m. The length of each side is $3(20) - 7 = 53$ m. So the length of the diagonal section is $\sqrt{53^2 + 53^2} \doteq 75$ m. The total length of the fence is $212 + 75 = 287$ m.

15. a) $(s + 8)(s - 8)$ **b)** $(d + 11)(d - 11)$
c) $(2h + 5)(2h - 5)$ **d)** $9(n + 3)(n - 3)$
e) $4(6 - b)(6 + b)$ **f)** $2c(7 - 3d)(7 + 3d)$

16. a) $(b + 7)^2$ **b)** $(12 + w)^2$
c) $(4 - 3g)^2$ **d)** $(8s - 13t)^2$

17. a) $(9 - x)(9 + x)$
b) $10y(x^2 + 1)(x - 1)(x + 1)$
c) $(3x + 5)(3x + 5)$
d) $4(2x + 5y)(2x - 5y)$
e) $(x^2 - 8)(x^2 - 8)$
f) $-2y(2x + 3)(2x + 3)$

18. a) -36 should be 36.
b) There needs to be a *difference* of squares.
c) $3y^2$ needs to be $9y^2$.
d) 40 is not a square. The value should be 49.