

TT 5. Possible Solutions

Foundations and Pre-calculus Mathematics 10 (Pearson), questions 4, 14.a), 14.c), 14.e), 14.g), 15.d), 21.b), 21.d), and 21.f) on pages 166 and 167 (**Note:** The textbook may use a colour scheme for algebra tiles that does not align with the scheme used in the course.)

4. a) $x^2 + 4x + 3 = (x + 3)(x + 1)$
b) $x^2 + 6x + 8 = (x + 4)(x + 2)$
c) $x^2 + 10x + 25 = (x + 5)(x + 5)$ or $(x + 5)^2$
d) $x^2 + 9x + 18 = (x + 6)(x + 3)$

14. a) The product is -20 . The sum is 19 . The numbers are -1 and 20 .

$$b^2 + 19b - 20 = (b - 1)(b + 20)$$

Check:

$$\begin{aligned}(b - 1)(b + 20) &= b(b + 20) - 1(b + 20) \\ &= b^2 + 20b - b - 20 \\ &= b^2 + 19b - 20\end{aligned}$$

- c) The product is -28 . The sum is 12 . The numbers are 14 and -2 .

$$x^2 + 12x - 28 = (x + 14)(x - 2)$$

Check:

$$\begin{aligned}(x + 14)(x - 2) &= x(x - 2) + 14(x - 2) \\ &= x^2 - 2x + 14x - 28 \\ &= x^2 + 12x - 28\end{aligned}$$

- e) The product is -20 . The sum is -1 . The numbers are -5 and 4 .

$$a^2 - a - 20 = (a - 5)(a + 4)$$

Check:

$$\begin{aligned}(a - 5)(a + 4) &= a(a + 4) - 5(a + 4) \\ &= a^2 + 4a - 5a - 20 \\ &= a^2 - a - 20\end{aligned}$$

- g) The product is 50 . The sum is -15 . The numbers are -10 and -5 .

$$m^2 - 15m + 50 = (m - 10)(m - 5)$$

Check:

$$\begin{aligned}(m - 10)(m - 5) &= m(m - 5) - 10(m - 5) \\ &= m^2 - 5m - 10m + 50 \\ &= m^2 - 15m + 50\end{aligned}$$

15. d) Since the z^2 term is negative, use -1 as the common factor.

$$72 - z - z^2 = -1(-72 + z + z^2)$$

Now it is traditional to have the square term first so we re-arrange the expression to get

$$-1(z^2 + z - 72)$$

The product is -72 . The sum is 1 . The numbers are 9 and -8 .

$$z^2 + z - 72 = (z + 9)(z - 8)$$

Therefore, the final answer is

$$-1(z + 9)(z - 8)$$

Check:

$$\begin{aligned}
 & -1(z + 9)(z - 8) \\
 & = -1[z(z - 8) + 9(z - 8)] \\
 & = -1(z^2 - 8z + 9z - 72) \\
 & = -1(z^2 + z - 72) \\
 & = -z^2 - z + 72 \text{ or } 72 - z - z^2
 \end{aligned}$$

- 21. b)** Take out GCF first: $-3(m^2 + 6m + 8)$. The product is 8. The sum is 6. The numbers are 4 and 2.

$$-3m^2 - 18m - 24 = -3(m + 4)(m + 2)$$

- d)** Take out GCF first: $10(x^2 + 8x + 12)$. The product is 12. The sum is 8. The numbers are 6 and 2.

$$10x^2 + 80x + 120 = 10(x + 6)(x + 2)$$

- f)** Take out GCF first: $7(c^2 - 5c + 6)$. The product is 6. The sum is -5 . The numbers are -3 and -2 .

$$7c^2 - 35c + 42 = 7(c - 3)(c - 2)$$