

Factoring Algebraic Expressions Review

Answer key Final answers only. Try first, then check.

CORE SKILLS

K1 a) $7a^2b^2(2a - 3b^2 + 1)$
b) $(x - 4)(x^2 - 3)$
c) $(3x - 5)(2y - 3)$

K2 a) $(x + 3)(x + 8)$
b) $(x - 7)(x + 5)$
c) $(x - 4y)(x - 9y)$

K3 a) $(3x + 4)(x + 2)$
b) $(3x + 4)(2x - 5)$
c) $2(10x - 3)(x - 1)$

K4 a) $(7x - 6y)(7x + 6y)$
b) $(2x - 5)^2$
c) $(3x + 2)(3x + 8)$

K5 a) $-2(x - 2)(x - 5)$
b) $(4x^2 + 1)(2x - 1)(2x + 1)$
c) $(x + 2)(x - 3)(x + 3)$

REAL WORLD

A1 a) $R = -2(3x - 40)(x + 15)$
b) $R = (30 + 2x)(40 - 3x)$; 40 - 3x is the number of bikes rented per day; 40 bikes at \$30.
c) No: $\frac{40}{3}$ is not a whole number of \$2 increases. Largest: $x = 13$ (price \$56, 1 bike), so $R = \$56$.

A2 a) $(s - f)(s + f) \text{ m}^2$
b) $(32)(60) = 1920 \text{ m}^2$, so \$163,200
c) $(46 - 50)(46 + 50) = -384$: a negative area is impossible. The fountain is wider than the plaza; it must be less than 46 m wide.

A3 a) $V = 4x(x - 10)(x - 15)$
b) $V = x(20 - 2x)(30 - 2x)$; at $x = 4$: $4 \times 12 \times 22 = 1056 \text{ cm}^3$
c) No: the sheet is only 20 cm wide, so the width $20 - 2x$ would be -10 cm . Realistic values: $0 < x < 10$.

THINK IT THROUGH

T1 a) $(x - 6)(x + 1)$ is zero at $x = 6$ and $x = -1$, but the graph crosses the x -axis at $x = -\frac{1}{2}$ and $x = 3$ (and its y -intercept is -3 , not -6).
b) -6 and 1 split the middle term; they do not go in the brackets. $2x^2 - 6x + x - 3 = 2x(x - 3) + 1(x - 3) = (2x + 1)(x - 3)$
c) When $a = 1$, $ac = c$ and grouping gives $x(x - 6) + 1(x - 6) = (x + 1)(x - 6)$, so the numbers land in the brackets. When $a \neq 1$, grouping puts the factor 2 into a bracket: $(2x + 1)(x - 3)$.

T2 a) $x = 1$: 16 and 10; $x = -3$: 0 and 18. No: one counterexample ($x = 1$) disproves the claim.
b) $x^2 + 6x + 9$; equal only at $x = 0$ (they differ by $6x$).
c) Any x works, e.g. $x = 0$: $9 \neq -9$, since $(x + 3)(x - 3) = x^2 - 9$. Two integers with product 9 have the same sign, so their sum cannot be 0.

BOSS LEVEL

- Boss**
- a) $m = 25, n = 23$
 - b) $(25, 23), (14, 10), (11, 5), (10, 2)$
 - c) $m - n$ and $m + n$ differ by $2n$, so both are odd or both are even. Their product is then odd or a multiple of 4, and 98 is neither.
-

Free worksheet · vertexmath.ca · Free to print and share for classroom use

Free to print, copy, adapt and share for classroom use · CC BY-NC 4.0 · © VertexMath



vertexmath.ca

Hints, answers &
more worksheets