

# Beginning and Intermediate Algebra

## Chapter 6: Factoring

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### Answers - Greatest Common Factor

- |                             |                                       |
|-----------------------------|---------------------------------------|
| 1) $9 + 8b^2$               | 17) $5(6b^9 + ab - 3a^2)$             |
| 2) $x - 5$                  | 18) $3y^2(9y^5 + 4x + 3)$             |
| 3) $5(9x^2 - 5)$            | 19) $-8a^2b(6b + 7a + 7a^3)$          |
| 4) $1 + 2n^2$               | 20) $5(6m^6 + 3mn^2 - 5)$             |
| 5) $7(8 - 5p)$              | 21) $5x^3y^2z(4x^5z + 3x^2 + 7y)$     |
| 6) $10(5x - 8y)$            | 22) $3(p + 4q - 5q^2r^2)$             |
| 7) $7ab(1 - 5a)$            | 23) $10(5x^2y + y^2 + 7xz^2)$         |
| 8) $9x^2y^2(3y^3 - 8x)$     | 24) $10y^4z^3(3x^5 + 5z^2 - x)$       |
| 9) $3a^2b(-1 + 2ab)$        | 25) $5q(6pr - p + 1)$                 |
| 10) $4x^3(2y^2 + 1)$        | 26) $7b(4 + 2b + 5b^2 + b^4)$         |
| 11) $-5x^2(1 + x + 3x^2)$   | 27) $3(-6n^5 + n^3 - 7n + 1)$         |
| 12) $8n^5(-4n^4 + 4n + 5)$  | 28) $3a^2(10a^6 + 2a^3 + 9a + 7)$     |
| 13) $10(2x^4 - 3x + 3)$     | 29) $10x^{11}(-4 - 2x + 5x^2 - 5x^3)$ |
| 14) $3(7p^6 + 10p^2 + 9)$   | 30) $4x^2(-6x^4 - x^2 + 3x + 1)$      |
| 15) $4(7m^4 + 10m^3 + 2)$   | 31) $4mn(-8n^7 + m^5 + 3n^3 + 4)$     |
| 16) $2(-5x^4 + 10y^2 + 6x)$ | 32) $2y^7(-5 + 3y^3 - 2xy^3 - 4xy)$   |

### Answers - Grouping

- |                         |                           |                           |
|-------------------------|---------------------------|---------------------------|
| 1) $(8r^2 - 5)(5r - 1)$ | 11) $(7x + 5)(y - 7)$     | 21) $(4u + 3)(8v - 5)$    |
| 2) $(5x^2 - 8)(7x - 2)$ | 12) $(7r^2 + 3)(6r - 7)$  | 22) $2(u + 3)(2v + 7u)$   |
| 3) $(n^2 - 3)(3n - 2)$  | 13) $(8x + 3)(4y + 5x)$   | 23) $(5x + 6)(2y + 5)$    |
| 4) $(2v^2 - 1)(7v + 5)$ | 14) $(3a + b^2)(5b - 2)$  | 24) $(4x - 5y^2)(6y - 5)$ |
| 5) $(3b^2 - 7)(5b + 7)$ | 15) $(8x + 1)(2y - 7)$    | 25) $(3u - 7)(v - 2u)$    |
| 6) $(6x^2 + 5)(x - 8)$  | 16) $(m + 5)(3n - 8)$     | 26) $(7a - 2)(8b - 7)$    |
| 7) $(3x^2 + 2)(x + 5)$  | 17) $(2x + 7y^2)(y - 4x)$ | 27) $(2x + 1)(8y + 3x)$   |
| 8) $(7p^2 + 5)(4p + 3)$ | 18) $(m - 5)(5n + 2)$     |                           |
| 9) $(7x^2 - 4)(5x - 4)$ | 19) $(5x - y)(8y + 7)$    |                           |
| 10) $(7n^2 - 5)(n + 3)$ | 20) $(8x - 1)(y + 7)$     |                           |

Answers - Trinomials wehre a = 1

- |                  |                     |                        |
|------------------|---------------------|------------------------|
| 1) $(p+9)(p+8)$  | 13) $(p+6)(p+9)$    | 25) Not factorable     |
| 2) $(x-8)(x+9)$  | 14) $(p+10)(p-3)$   | 26) $4(x+7)(x+6)$      |
| 3) $(n-8)(n-1)$  | 15) Not factorable  | 27) $5(a+10)(a+2)$     |
| 4) $(x-5)(x+6)$  | 16) $(m-5n)(m-10n)$ | 28) $5(n-8)(n-1)$      |
| 5) $(x+1)(x-10)$ | 17) $(u-5v)(u-3v)$  | 29) $6(a-4)(a+8)$      |
| 6) $(x+5)(x+8)$  | 18) $(m+5n)(m-8n)$  | 30) $5(v-1)(v+5)$      |
| 7) $(b+8)(b+4)$  | 19) Not factorable  | 31) $6(x+2y)(x+y)$     |
| 8) $(b-10)(b-7)$ | 20) $(x+8y)(x+2y)$  | 32) $5(m^2+6mn-18n^2)$ |
| 9) $(x-7)(x+10)$ | 21) $(x-9y)(x-2y)$  | 33) $6(x+9y)(x+7y)$    |
| 10) $(x-3)(x+6)$ | 22) $(u-7v)(u-2v)$  | 34) $6(m-9n)(m+3n)$    |
| 11) $(n-5)(n-3)$ | 23) $(x-3y)(x+4y)$  |                        |
| 12) $(a+3)(a-9)$ | 24) $(x+5y)(x+9y)$  |                        |

Answers - Trinomials where a is not 1

- |                   |                     |                       |
|-------------------|---------------------|-----------------------|
| 1) $(7x-6)(x-6)$  | 15) $(3x-5)(x-4)$   | 29) $(k-4)(4k-1)$     |
| 2) $(7n-2)(n-6)$  | 16) $(3u-2v)(u+5v)$ | 30) $(r-1)(4r+7)$     |
| 3) $(7b+1)(b+2)$  | 17) $(3x+2y)(x+5y)$ | 31) $(x+2y)(4x+y)$    |
| 4) $(7v+4)(v-4)$  | 18) $(7x+5y)(x-y)$  | 32) Not factorable    |
| 5) $(5a+7)(a-4)$  | 19) $(5x-7y)(x+7y)$ | 33) $(m-3n)(4m+3n)$   |
| 6) Not factorable | 20) $(5u-4v)(u+7v)$ | 34) Not factorable    |
| 7) $(2x-1)(x-2)$  | 21) $3(2x+1)(x-7)$  | 35) $(x+3y)(4x+y)$    |
| 8) $(3r+2)(r-2)$  | 22) $2(5a+3)(a-6)$  | 36) $3(3u+4v)(2u-3v)$ |
| 9) $(2x+5)(x+7)$  | 23) $3(7k+6)(k-5)$  | 37) $2(2x+7y)(3x+5y)$ |
| 10) $(7x-6)(x+5)$ | 24) $3(7n-6)(n+3)$  | 38) $4(x+3y)(4x+3y)$  |
| 11) $(2b-3)(b+1)$ | 25) $2(7x-2)(x-4)$  | 39) $4(x-2y)(6x-y)$   |
| 12) $(5k-6)(k-4)$ | 26) Not factorable  | 40) $2(3x+2y)(2x+7y)$ |
| 13) $(5k+3)(k+2)$ | 27) $(x+4)(6x+5)$   |                       |
| 14) $(3r+7)(r+3)$ | 28) $(3p+7)(2p-1)$  |                       |

Answers - Special Products

- |                 |                 |
|-----------------|-----------------|
| 1) $(r+4)(r-4)$ | 3) $(v+5)(v-5)$ |
| 2) $(x+3)(x-3)$ | 4) $(x+1)(x-1)$ |

- |                       |                                  |
|-----------------------|----------------------------------|
| 5) $(p+2)(p-2)$       | 23) $(5a+3b)^2$                  |
| 6) $(2v+1)(2v-1)$     | 24) $(x+4y)^2$                   |
| 7) $(3k+2)(3k-2)$     | 25) $(2a-5b)^2$                  |
| 8) $(3a+1)(3a-1)$     | 26) $2(3m-2n)^2$                 |
| 9) $3(x+3)(x-3)$      | 27) $2(2x-3y)^2$                 |
| 10) $5(n+2)(n-2)$     | 28) $5(2x+y)^2$                  |
| 11) $4(2x+3)(2x-3)$   | 29) $(2-m)(4+2m+m^2)$            |
| 12) $5(25x^2+9y^2)$   | 30) $(x+4)(x^2-4x+16)$           |
| 13) $2(3a+5b)(3a-5b)$ | 31) $(x-4)(x^2+4x+16)$           |
| 14) $4(m^2+16n^2)$    | 32) $(x+2)(x^2-2x+4)$            |
| 15) $(a-1)^2$         | 33) $(6-u)(36+6u+u^2)$           |
| 16) $(k+2)^2$         | 34) $(5x-6)(25x^2+30x+36)$       |
| 17) $(x+3)^2$         | 35) $(5a-4)(25a^2+20a+16)$       |
| 18) $(n-4)^2$         | 36) $(4x-3)(16x^2+12x+9)$        |
| 19) $(x+5)^2$         | 37) $(4x+3y)(16x^2-12xy+9y^2)$   |
| 20) $(k-2)^2$         | 38) $4(2m-3n)(4m^2+6mn+9n^2)$    |
| 21) $(5p-1)^2$        | 39) $2(3x+5y)(9x^2-15xy+25y^2)$  |
| 22) $(x+1)^2$         | 40) $3(5m+6n)(25m^2-30mn+36n^2)$ |

#### Answers - Strategy

- |                              |                            |
|------------------------------|----------------------------|
| 1) $3(2a+5y)(4z-3h)$         | 11) $n(n-1)$               |
| 2) $(2x-5)(x-3)$             | 12) $(5x+3)(x-5)$          |
| 3) $(5u-4v)(u-v)$            | 13) $(x-3y)(x-y)$          |
| 4) $4(2x+3y)^2$              | 14) $5(3u-5v)^2$           |
| 5) $2(-x+4y)(x^2+4xy+16y^2)$ | 15) $(3x+5y)(3x-5y)$       |
| 6) $5(4u-x)(v-3u^2)$         | 16) $(x-3y)(x^2+3xy+9y^2)$ |
| 7) $n(5n-3)(n+2)$            | 17) $(m+2n)(m-2n)$         |
| 8) $x(2x+3y)(x+y)$           | 18) $3(2a+n)(2b-3)$        |
| 9) $2(3u-2)(9u^2+6u+4)$      | 19) $4(3b^2+2x)(3c-2d)$    |
| 10) $2(3-4x)(9+12x+16x^2)$   | 20) $3m(m+2n)(m-4n)$       |

- |                                      |                            |
|--------------------------------------|----------------------------|
| 21) $2(4 + 3x)(16 - 12x + 9x^2)$     | 32) $2(4x + 3y)(4x - 3y)$  |
| 22) $(4m + 3n)(16m^2 - 12mn + 9n^2)$ | 33) $(m - 4x)(n + 3)$      |
| 23) $2x(x + 5y)(x - 2y)$             | 34) $(2k + 5)(k - 2)$      |
| 24) $(3a + x^2)(c + 5d^2)$           | 35) $(4x - y)^2$           |
| 25) $n(n + 2)(n + 5)$                | 36) $v(v + 1)$             |
| 26) $(4m - n)(16m^2 + 4mn + n^2)$    | 37) $3(3m + 4n)(3m - 4n)$  |
| 27) $(3x - 4)(9x^2 + 12x + 16)$      | 38) $x^2(x + 4)$           |
| 28) $(4a + 3b)(4a - 3b)$             | 39) $3x(3x - 5y)(x + 4y)$  |
| 29) $x(5x + 2)$                      | 40) $3n^2(3n - 1)$         |
| 30) $2(x - 2)(x - 3)$                | 41) $2(m - 2n)(m + 5n)$    |
| 31) $3k(k - 5)(k - 4)$               | 42) $v^2(2u - 5v)(u - 3v)$ |

Answers - Solving Equations by Factoring

- |                           |                                     |                            |
|---------------------------|-------------------------------------|----------------------------|
| 1) $\{7, -2\}$            | 14) $\{8, 0\}$                      | 27) $\{-\frac{3}{7}, -3\}$ |
| 2) $\{-4, 3\}$            | 15) $\{1, 4\}$                      | 28) $\{-\frac{4}{3}, -3\}$ |
| 3) $\{1, -4\}$            | 16) $\{4, 2\}$                      | 29) $\{\frac{8}{3}, -5\}$  |
| 4) $\{-\frac{5}{2}, 7\}$  | 17) $\{\frac{3}{7}, -8\}$           | 30) $\{2, -3\}$            |
| 5) $\{-5, 5\}$            | 18) $\{-\frac{1}{7}, -8\}$          | 31) $\{-7, 7\}$            |
| 6) $\{4, -8\}$            | 19) $\{\frac{4}{7}, -3\}$           | 32) $\{-4, -6\}$           |
| 7) $\{2, -7\}$            | 20) $\{\frac{1}{4}, 3\}$            | 33) $\{-\frac{5}{2}, -8\}$ |
| 8) $\{-5, 6\}$            | 21) $\{-4, -3\}$                    | 34) $\{-\frac{6}{5}, -7\}$ |
| 9) $\{-\frac{5}{7}, -3\}$ | 22) $\{8, -4\}$                     | 35) $\{\frac{4}{5}, -6\}$  |
| 10) $\{-\frac{7}{8}, 8\}$ | 23) $\{8, -2\}$                     | 36) $\{\frac{5}{3}, -2\}$  |
| 11) $\{-\frac{1}{5}, 2\}$ | 24) $\{4, 0\}$                      |                            |
| 12) $\{-\frac{1}{2}, 2\}$ | 25) $\{\frac{8}{3}, -5\}$           |                            |
| 13) $\{4, 0\}$            | 26) $\{-\frac{1}{2}, \frac{5}{3}\}$ |                            |