

2.11 Exercise Factoring Review

B You must be able to recognize which skills must be used to factor a polynomial. When you factor the following polynomials, always check for a common factor first. There are at least two expressions that cannot be factored. Can you find others?

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|--------------------------------|----------------------------------|-------------------------|
| 1. $3a^2 + 6a$ | 2. $2x - 8xy$ | 3. $36a^3 - 4a^2$ |
| 4. $25a^4 - 9y^4$ | 5. $x^2 + 7x + 12$ | 6. $3a^2 - 3b^2$ |
| 7. $y^2 - 11y + 28$ | 8. $16x^2 - 8x + 1$ | 9. $a^2 - ab - 56b^2$ |
| 10. $4x^2 - 11x + 6$ | 11. $-1 + 9k^2$ | 12. $1 + 18y + 32y^2$ |
| 13. $2y^2 - 8y^3$ | 14. $x^2 + 6x + 8$ | 15. $56x^2 + 9x - 2$ |
| 16. $-16 - 9x^2$ | 17. $16 - 28x + 10x^2$ | 18. $m^4 - 16$ |
| 19. $8 - 14y + 5y^2$ | 20. $-(1 - a^4)$ | 21. $m^4 - 5m^2 - 36$ |
| 22. $6a^2 + 5a + 1$ | 23. $x^4 - y^4$ | 24. $p^2 - 2pq - 63q^2$ |
| 25. $m^4 + 3m^2 - 4$ | 26. $x^2 - xy$ | 27. $x^2 + 3xy - x$ |
| 28. $a^2 - 144$ | 29. $3a^2 - 36a + 36$ | 30. $(a + b)^2 - c^2$ |
| 31. $-a^2 - 2ab - b^2$ | 32. $x^3 + 5x^2 - 6$ | 33. $x^4 + 18x^2 + 32$ |
| 34. $m^4 - 9m^2 - 112$ | 35. $x^8 - 1$ | 36. $2y^2 - 2y - 24$ |
| 37. $2x^2 - 8$ | 38. $4y^2 + 8y - 60$ | 39. $m^4 - 16$ |
| 40. $2x^2 - 16x + 32$ | 41. $x^3 - xy^2$ | 42. $x^4 - 5x^2 + 4$ |
| 43. $-48 - 3y^2$ | 44. $x^2y^3z - 2xy^2$ | |
| 45. $(x - y)^2 - (x + y)^2$ | 46. $9(a + b)^2 - (a - b)^2$ | |
| 47. $(a - b)^2 - 16(a + 2b)^2$ | 48. $25(2x + 1)^2 - (9x - 1)^2$ | |
| 49. $4(x - y)^2 - 16(x + y)^2$ | 50. $25(x + 2y)^2 - 9(x - 2y)^2$ | |

SOLUTIONS

- 2.11 Exercise, page 102
1. $3a(a + 2)$ 2. $2x(1 - 4y)$ 3. $4a^2(9a - 1)$
 4. $(5a + 3)^2(5a - 3)^2$ 5. $(x + 4)(x + 3)$ 6. $3(a - b)(a + b)$
 7. $(y - 4)(y - 7)$ 8. $(4x - 1)^2$ 9. $(a - 8b)(a + 7b)$
 10. $(4x - 3)(x + 2)$ 11. $(3k + 1)(k + 1)$ 12. $(1 + 2y)(1 + 16y)$
 13. $2y^2(1 - 4y)$ 14. $(x + 2)(x + 4)$ 15. $(8x - 1)(7x + 2)$
 16. $-(3x + 2)(3x + 4)$ 17. $2(4 - 5x)(2 - x)$ 18. cannot be factored
 19. $(8 - 14y + 5y^2)$ 20. $-(1 - a^4)$ 21. cannot be factored
 22. $(6a + 5a + 1)$ 23. $(x^2 - y^2)(x^2 + y^2)$ 24. $(p - 9q)(p + 7q)$
 25. $(m^2 + 4)(m + 2)(m - 2)$ 26. $x^2 - xy$ 27. $x(x + 3y - 1)(x + 3y - 1)$
 28. $(a^2 - 144)$ 29. $3(a^2 - 12a + 12)$ 30. $(a + b + c)(a + b - c)$
 31. $-(a + b)^2 - (a - b)^2$ 32. cannot be factored 33. $(x^2 + 2)(x^2 + 16)$
 34. $(m^2 + 7)(m + 4)(m - 4)$ 35. $(x^2 + 1)(x^2 + 1)(x^2 + 1)(x^2 + 1)$
 36. $2y^2 - 2y - 24$ 37. $2(x + 2)(x - 2)(x - 2)(x - 2)$
 38. $4y^2 + 8y - 60$ 39. $(m^2 + 4)(m + 2)(m - 2)$
 40. $2x^2 - 16x + 32$ 41. $x^3 - xy^2$ 42. $(x + 2)(x + 1)(x - 1)(x - 1)$
 43. $-48 - 3y^2$ 44. $x^2y^3z - 2xy^2$ 45. $(x + 2)(x + 1)(x - 1)(x - 1)$
 46. $4(2a + b)(a + 2b)$ 47. $-3(5a + 7b)(a + 3b)$ 48. $25(2x + 1)^2 - (9x - 1)^2$
 49. $4(x - y)^2 - 16(x + y)^2$ 50. $8(2x + y)(x + 8y)$