



Practice

9.6 Factoring Special Polynomials

Use the generalization of a perfect-square trinomial or the difference of two squares to find each product.

1. $(x - 1)^2$ _____ 2. $(2x + 3)^2$ _____

3. $(a + 5)^2$ _____ 4. $(3g + 1)^2$ _____

5. $(2a - 5)^2$ _____ 6. $(x - y)^2$ _____

7. $(x + 2y)^2$ _____ 8. $(3m - n)^2$ _____

9. $(x - 3)(x + 3)$ _____ 10. $(4y + 1)(4y - 1)$ _____

11. $(5x + 2)(5x - 2)$ _____ 12. $(6r - s)(6r + s)$ _____

Factor each polynomial completely.

13. $x^2 - 25$ _____ 14. $y^2 - 49$ _____

15. $2x^2 - 2$ _____ 16. $4y^2 - 16$ _____

17. $16y^2 - 25$ _____ 18. $121 - x^2$ _____

19. $9 - 16y^2$ _____ 20. $x^2 - 6x + 9$ _____

21. $x^2 + 10x + 25$ _____ 22. $y^2 - 16y + 64$ _____

23. $z^2 - 20z + 100$ _____ 24. $64x^2 - 48xy + 9y^2$ _____

25. $25 - 10a + a^2$ _____ 26. $4m^2 + 4m + 1$ _____

27. $81r^2s^2 - 100t^4q^4$ _____ 28. $16x^2 + 24x + 9$ _____

29. $x^2 + 2xy + y^2$ _____ 30. $4a^2 + 4ab + b^2$ _____

31. $y^2 - x^2$ _____ 32. $25a^2 - 1$ _____

33. $1 - x^2y^4$ _____ 34. $144c^2 - 120cd + 25d^2$ _____

35. $6a^2 - 216b^2$ _____ 36. $49x - xy^2$ _____

37. $12x^4 - 12$ _____ 38. $b^4 - 2b^2 + b^2 - 2$ _____

39. $4c^2 - 24c + 36$ _____ 40. $4m^4n^2 + 4m^3n^2 + m^2n^2$ _____



Practice

9.7 Factoring Quadratic Trinomials

Write each trinomial in factored form.

1. $x^2 + x - 30$ _____ 2. $m^2 + 9m + 20$ _____

3. $c^2 - c - 72$ _____ 4. $d^2 - 7d + 12$ _____

5. $y^2 + y - 156$ _____ 6. $f^2 - 2f - 48$ _____

For each polynomial, write all of the factor pairs of the third term, and then circle the pair that would successfully factor the polynomial.

7. $n^2 - 8n + 15$ _____ 8. $t^2 - 121$ _____

9. $s^2 + 5s + 4$ _____ 10. $q^2 - 2q - 35$ _____

Write each trinomial as a product of its factors. Use factoring patterns, graphing, or algebra tiles to assist you in your work.

11. $g^2 - 3g - 40$ _____ 12. $h^2 + 6h - 40$ _____

13. $j^2 + 22j + 40$ _____ 14. $k^2 - 39k - 40$ _____

15. $x^2 - x - 12$ _____ 16. $y^2 - 7y - 18$ _____

17. $a^2 - 9a + 14$ _____ 18. $x^2 - 5x - 6$ _____

19. $x^2 - 8x + 15$ _____ 20. $p^2 + 18p + 45$ _____

21. $x^2 - 9x - 36$ _____ 22. $x^2 - x - 42$ _____

23. $x^2 - 81$ _____ 24. $x^2 + 17x + 60$ _____

25. $x^2 + 4x - 12$ _____ 26. $x^2 + 14x - 32$ _____

27. $x^2 + 12x + 35$ _____ 28. $x^2 - x - 72$ _____

29. $x^2 + 17x + 72$ _____ 30. $x^2 - 17x + 72$ _____

31. $x^2 + x - 72$ _____ 32. $x^3 + 7x^2 + 12x$ _____

33. $2x^2 + 6x + 3$ _____ 34. $6x^2 + 8x - 30$ _____

35. $5x^2 + 7xy + 2y^2$ _____ 36. $14x^2 + 23xy + 3y^2$ _____



Practice

11.3 Simplifying Rational Expressions

For what values of the variable is each rational expression undefined?

1. $\frac{n-2}{2-n}$ _____

2. $\frac{(w-2)(w-3)}{(w+5)(w-4)}$ _____

3. $\frac{10m}{m}$ _____

4. $\frac{6}{x(x^2+2x+1)}$ _____

Write the common factors.

5. $\frac{5 \cdot 3}{2 \cdot 5}$ _____

6. $\frac{a^4b}{ab}$ _____

7. $\frac{(r+2)(r+3)}{r(r+3)}$ _____

8. $\frac{(x+3)^2}{x^2-9}$ _____

9. $\frac{y^2-y-6}{y^2-9}$ _____

10. $\frac{3-k}{k^2-2k-3}$ _____

Simplify.

11. $\frac{x^3}{3x}$ _____

12. $\frac{2(x+y)}{8(x+y)^2}$ _____

13. $\frac{a+4}{2a+8}$ _____

14. $\frac{8w-12}{4}$ _____

15. $\frac{p+7}{p^2-49}$ _____

16. $\frac{64-x^2}{8-x}$ _____

17. $\frac{h^2+h-12}{h^2+5h+4}$ _____

18. $\frac{f+g}{3(f+g)^3}$ _____

19. $\frac{3x^2-12x-15}{3x^2-18x+15}$ _____

20. $\frac{5z^3-125z}{10z^2-250}$ _____

21. $\frac{2x^2+16x+32}{x+4}$ _____

22. $\frac{y^2-25}{y^2-10y+25}$ _____



Practice

11.4 Operations With Rational Expressions

Perform the indicated operations. Simplify and state the restrictions on the variables.

1. $\frac{3}{5z} + \frac{4}{5z}$ _____

2. $\frac{6}{x-3} + \frac{2}{x-3}$ _____

3. $\frac{5a}{a+b} - \frac{2a}{a+b}$ _____

4. $\frac{x}{x-1} - \frac{1}{x-1}$ _____

5. $\frac{1}{p} - \frac{2}{q}$ _____

6. $\frac{c}{3d} + \frac{d}{3c}$ _____

7. $\frac{4}{mn} \cdot \frac{m}{2}$ _____

8. $\frac{y^2}{6} \cdot \frac{12}{y^3}$ _____

9. $\frac{x^3}{6} + \frac{x^2}{12}$ _____

10. $\frac{a^2(a-3)}{3-a}$ _____

11. $\frac{a^3}{(a+1)^2} + \frac{a}{(a+1)^2}$ _____

12. $\frac{t^2+2t}{t^2-4} \cdot \frac{3t-6}{t}$ _____

13. $\frac{y^2+5y+6}{y^2} \cdot \frac{y}{y+2}$ _____

14. $\frac{3x}{3x-2} - \frac{2}{3x-2}$ _____

15. $\frac{m^2-n^2}{m^2n^2} \cdot \frac{mn}{1}$ _____

16. $\frac{1}{x+1} + \frac{x}{x^2-1}$ _____

17. $\frac{3x^2}{1-x^2} - \frac{2-x}{1-x^2}$ _____

18. $\frac{8b-40}{8} \cdot \frac{b+5}{b^2-25}$ _____

19. $\frac{6}{c^2-3c} \cdot \frac{2c^2-2c-12}{6c+12}$ _____

20. $\frac{x}{x+y} - \frac{-3xy}{(x+y)^2}$ _____

21. $4 + \frac{3x}{x^2-6}$ _____

22. $\frac{3}{z-1} + \frac{z}{1-z}$ _____

23. $\frac{4}{x-3} \cdot \frac{1}{x}$ _____

24. $\frac{n+4}{16} \cdot \frac{12}{n^2-16}$ _____

25. $\frac{2}{x+5} + \frac{3x}{x^2+4x-5}$ _____

26. $\frac{3d}{d^2-9} + \frac{d}{3+d}$ _____