

PRACTICE Factoring

Name _____

1. $4x^2 - 9$

2. $36x^2 - y^2$

3. $18y^2 + 21yx - 4x^2$

4. $6t^2 - 7t - 3$

5. $4x^2 - 12x + 9$

6. $x^2 - x - 72$

7. $2y^2 - 7y + 5$

8. $x^2 - y^2$

9. $10x^2 - x - 2$

10. $3z^2 - 3z - 4$

11. $9x^2 + 6x + 1$

12. $y^2 + 15y + 56$

13. $2w^2 + 9w + 10$

14. $2x^2 + 10x$

15. $6x^2 + 11x + 4$

16. $x^2 + 8x + 15$

17. $3x^2 + 7x + 2$

18. $4x^2 + 18x + 20$

19. $9k^2 - 1$

20. $2x^2 - 19xy + 42y^2$

21. $x^2 + 3x$

22. $144r^2 - 49s^2$

23. $x^2 + 5x + 6$

24. $y(x + s) + z(x + s)$

25. $x^2 + 6x + 9$

26. $4x^2 - 40x + 84$

27. $16k^2 - 49$

28. $c^2 - 11c + 30$

29. $6s^2 - 29s + 35$

30. $25w^2 - 36$

31. $4r^2 - 20r + 25$

32. $15r^2 - 23rs + 4s^2$

33. $x^2 - 8x + 16$

34. $9x^2 + 12xy + 4y^2$

35. $2d^2 - 11d - 6$

36. $25r^2 - 36s^2$

37. $2r^2 + 13r + 20$

38. $x^2 + 14x + 49$

39. $15r^2 - 7r - 2$

40. $13x^2 - 57x + 20$

41. $y^2 - 49$

42. $x^2 - 6x + 9$

43. $75x^2 + 210xy + 147y^2$

44. $36m^2 - 96mn + 64n^2$

45. $4 - 9w^2$

46. $9x^2 + 8x + 25$

47. Determine two values of k so that each expression can be factored.

a. $kx^2 - 16$

b. $x^2 + kx - 15$

c. $x^2 + kx - 18$

d. $12x^2 + kx + 14$

PRACTICE Factoring ANSWERS

Name _____

1. $4x^2 - 9 = (2x+3)(2x-3)$

2. $36x^2 - y^2 = (6x+y)(6x-y)$

$\begin{matrix} 18 \\ 1 \end{matrix} \begin{pmatrix} 3 \\ 1 \end{pmatrix} \begin{matrix} 9 \\ 2 \end{matrix}$ $\begin{matrix} 1 \\ 1 \end{matrix} \begin{pmatrix} 1 \\ 1 \end{pmatrix} \begin{matrix} 2 \\ 2 \end{matrix}$ 3. $18y^2 + 21yx - 4x^2 = (3y+4x)(6y-x)$

$\begin{matrix} 6 \\ 1 \end{matrix} \begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{matrix} 3 \\ 1 \end{pmatrix}$ 4. $6t^2 - 7t - 3 = (2t-3)(3t+1)$

5. $4x^2 - 12x + 9 = (2x-3)^2$

6. $x^2 - x - 72 = (x-9)(x+8)$

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} \begin{pmatrix} -5 \\ -1 \end{pmatrix} \begin{matrix} 5 \\ 1 \end{matrix}$ 7. $2y^2 - 7y + 5 = (2y-5)(y-1)$

8. $x^2 - y^2 = (x+y)(x-y)$

$\begin{matrix} 10 \\ 1 \end{matrix} \begin{pmatrix} 2 \\ 5 \end{pmatrix} \begin{matrix} 2 \\ -1 \end{matrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ 9. $10x^2 - x - 2 = (2x-1)(5x+2)$

$\begin{matrix} 3 \\ 1 \end{matrix} \begin{matrix} 4 \\ 1 \end{matrix} \begin{matrix} 1 \\ 4 \end{matrix} \begin{matrix} 2 \\ 2 \end{matrix}$ 10. $3z^2 - 3z - 4$ not possible

$\begin{matrix} 3 \\ 3 \end{matrix} \begin{matrix} 1 \\ 1 \end{matrix}$ 11. $9x^2 + 6x + 1 = (3x+1)^2$

12. $y^2 + 15y + 56 = (y+7)(y+8)$

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} \begin{matrix} 2 \\ 5 \end{matrix} \begin{pmatrix} 5 \\ 2 \end{pmatrix}$ 13. $2w^2 + 9w + 10 = (2w+5)(w+2)$

14. $2x^2 + 10x = 2x(x+5)$

$\begin{matrix} 6 \\ 1 \end{matrix} \begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{matrix} 1 \\ 1 \end{matrix} \begin{matrix} 2 \\ 2 \end{matrix}$ 15. $6x^2 + 11x + 4 = (2x+1)(3x+4)$

16. $x^2 + 8x + 15 = (x+5)(x+3)$

$\begin{pmatrix} 3 \\ 1 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ 17. $3x^2 + 7x + 2 = (3x+1)(x+2)$

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} \begin{matrix} 2 \\ 5 \end{matrix} \begin{pmatrix} 5 \\ 2 \end{pmatrix}$ 18. $4x^2 + 18x + 20 = 2(2x^2 + 9x + 10) = 2(2x+5)(x+2)$

19. $9k^2 - 1 = (3k+1)(3k-1)$

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} \begin{matrix} 6 \\ 7 \end{matrix} \begin{pmatrix} 7 \\ 6 \end{pmatrix}$ 20. $2x^2 - 19xy + 42y^2 = (2x-7y)(x-6y)$

21. $x^2 + 3x = x(x+3)$

22. $144r^2 - 49s^2 = (12r+7s)(12r-7s)$

23. $x^2 + 5x + 6 = (x+2)(x+3)$

24. $y(x+s) + z(x+s) = (x+s)(y+z)$

25. $x^2 + 6x + 9 = (x+3)^2$

26.

$4x^2 - 40x + 84 = 4(x^2 - 10x + 21) = 4(x-3)(x-7)$

27. $16k^2 - 49 = (4k+7)(4k-7)$

28. $c^2 - 11c + 30 = (c-6)(c-5)$

$\begin{matrix} 6 \\ 1 \end{matrix} \begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{matrix} -5 \\ 7 \end{matrix}$ 29. $6s^2 - 29s + 35 = (2s-5)(3s-7)$

30. $25w^2 - 36 = (5w+6)(5w-6)$

$\begin{matrix} 2 \\ 5 \end{matrix}$ 31. $4r^2 - 20r + 25 = (2r-5)^2$

$\begin{matrix} 15 \\ 1 \end{matrix} \begin{pmatrix} 3 \\ 2 \end{pmatrix} \begin{matrix} 2 \\ 1 \end{matrix} \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ 32. $15r^2 - 23rs + 4s^2 = (3r-4s)(5r-s)$

33. $x^2 - 8x + 16 = (x-4)^2$

$\begin{matrix} 3 \\ 2 \end{matrix}$ 34. $9x^2 + 12xy + 4y^2 = (3x+2y)^2$

$\begin{pmatrix} 2 \\ 1 \end{pmatrix} \begin{matrix} 1 \\ 6 \end{matrix} \begin{matrix} 2 \\ 3 \end{matrix} \begin{matrix} 2 \\ 2 \end{matrix}$ 35. $2d^2 - 11d - 6 = (2d+1)(d-6)$

36. $25r^2 - 36s^2 = (5r+6s)(5r-6s)$

37. $2r^2 + 13r + 20 = (2r+5)(r+4)$

38. $x^2 + 14x + 49 = (x+7)^2$

$\begin{pmatrix} 3 \\ 1 \end{pmatrix} \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ 39. $15r^2 - 7r - 2 = (3r-2)(5r+1)$

$\begin{pmatrix} 13 \\ 1 \end{pmatrix} \begin{matrix} 1 \\ 5 \end{matrix} \begin{matrix} 5 \\ 4 \end{matrix}$ 40. $13x^2 - 57x + 20 = (13x-5)(x-4)$

41. $y^2 - 49 = (y+7)(y-7)$

42. $x^2 - 6x + 9 = (x-3)^2$

43. $75x^2 + 210xy + 147y^2 = 3(25x^2 + 70xy + 49y^2) = 3(5x+7y)^2 = 4(9m^2 - 24mn + 16n^2)$

44. $36m^2 - 96mn + 64n^2 = 4(3m-4n)^2$

45. $4 - 9w^2 = (2+3w)(2-3w)$

46. $9x^2 + 8x + 25$ not possible
 $\begin{matrix} 1 \\ 3 \end{matrix} \begin{matrix} 5 \\ 25 \end{matrix} \begin{matrix} 1 \\ 25 \end{matrix}$

47. Determine two values of k so that each expression can be factored.

a. $kx^2 - 16$ $k = 1, 4, 9, \dots$

$\begin{matrix} 1 \\ 15 \end{matrix} \begin{matrix} 3 \\ 5 \end{matrix}$ b. $x^2 + kx - 15$ $k = \mp 14, \pm 2$

$\begin{matrix} 18 \\ 1 \end{matrix} \begin{matrix} 2 \\ 9 \end{matrix} \begin{matrix} 3 \\ 6 \end{matrix}$ c. $x^2 + kx - 18$ $k = \pm 7, \pm 7, \pm 3$

d. $12x^2 + kx + 14$

$\begin{matrix} 12 \\ 1 \end{matrix} \begin{matrix} 2 \\ 6 \end{matrix} \begin{matrix} 3 \\ 4 \end{matrix} \quad \begin{matrix} 2 \\ 7 \end{matrix} \begin{matrix} 14 \\ 1 \end{matrix} \begin{matrix} 1 \\ 14 \end{matrix}$

$k = 86, 31, 26, 169$

$(26), 46, (86), 34$

$29, (34), 59, (46)$