

Page 333 #15-26 All

6.2 Practice and Applications (pp. 333-336)

15. yes; $f(x) = -5x + 12$; 1; linear; -5
16. yes; $f(x) = \frac{3}{5}x^4 + 2x + 9$; 4; quartic; $\frac{3}{5}$
17. yes; $f(x) = x + \pi$; 1; linear; 1
18. yes; $f(x) = x^2\sqrt{2} + x - 5$; 2; quadratic; $\sqrt{2}$
19. no
20. yes; $f(x) = -2$; 0; constant; -2
21. yes; $f(x) = x^2 - x + 1$; 2; quadratic; 1
22. no
23. yes; $f(x) = x^4 - x^3 + 36x^2$; 4; quartic; 1
24. no
25. yes; $f(x) = 3x^3$; 3; cubic; 3
26. no

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6.3 Practice and Applications (pp. 341-343)

13. $(8x^2 + 1) + (3x^2 - 2) = 11x^2 - 1$
14. $3x^3 + 10x + 5 - x^3 + 4x - 6 = 2x^3 + 14x - 1$
15. $x^2 - 6x + 5 - x^2 - x + 2 = -7x + 7$
16. $16 - 13x + 10x - 11 = -3x + 5$
17. $7x^3 - 1 - 15x^3 - 4x^2 + x - 3 = -8x^3 - 4x^2 + x - 4$
18. $8x + 14x + 3 - 41x^2 + x^3 = x^3 - 41x^2 + 22x + 3$
19. $4x^2 - 11x + 10 + 5x - 31 = 4x^2 - 6x - 21$
20. $9x^3 - 4 + x^2 + 8x - 7x^3 + 3x - 7$
 $= 2x^3 + x^2 + 11x - 11$
21. $-3x^3 + x - 11 - 4x^3 - x^2 + x$
 $= -7x^3 - x^2 + 2x - 11$
22. $6x^2 - 19x + 5 - 19x^2 + 4x - 9 = -13x^2 - 15x - 4$
23. $10x^3 - 4x^2 + 3x - x^3 + x^2 - 1 = 9x^3 - 3x^2 + 3x - 1$
24. $50x - 3 + 8x^3 + 7x^2 + x + 4 = 8x^3 + 7x^2 + 51x + 1$
25. $10x - 3 + 7x^2 + x^3 - 2x + 17 = x^3 + 7x^2 + 8x + 14$
26. $3x^3 - 5x^4 - 10x + 1 + 17x^4 - x^3 = 12x^4 + 2x^3 - 10x + 1$
27. $x(x^2 + 6x - 7) = x^3 + 6x^2 - 7x$
29. $-4x(x^2 - 8x + 3) = -4x^3 + 32x^2 - 12x$
30. $5x(3x^2 - x + 3) = 15x^3 - 5x^2 + 15x$
31. $(x - 4)(x - 7) = x^2 - 11x + 28$
32. $(x + 9)(x - 2) = x^2 + 7x - 18$
33. $(x + 3)(x^2 - 4x + 9)$
 $= x(x^2 - 4x + 9) + 3(x^2 - 4x + 9)$
 $= x^3 - 4x^2 + 9x + 3x^2 - 12x + 27$
 $= x^3 - x^2 - 3x + 27$

$$\begin{aligned}
 35. (2x + 5)(3x^3 - x^2 + x) &= 2x(3x^3 - x^2 + x) + 5(3x^3 - x^2 + x) \\
 &= 6x^4 - 2x^3 + 2x^2 + 15x^3 - 5x^2 + 5x \\
 &= 6x^4 + 13x^3 - 3x^2 + 5x
 \end{aligned}$$

$$\begin{aligned}
 36. (6x + 2)(2x^2 - 6x + 1) &= 6x(2x^2 - 6x + 1) + 2(2x^2 - 6x + 1) \\
 &= 12x^3 - 36x^2 + 6x + 4x^2 - 12x + 2 \\
 &= 12x^3 - 32x^2 - 6x + 2
 \end{aligned}$$

$$\begin{aligned}
 37. (x + 11)(x^2 - 5x + 9) &= x(x^2 - 5x + 9) + 11(x^2 - 5x + 9) \\
 &= x^3 - 5x^2 + 9x + 11x^2 - 55x + 99 \\
 &= x^3 + 6x^2 - 46x + 99
 \end{aligned}$$

$$\begin{aligned}
 38. (4x^2 - 1)(x^2 - 6x + 9) &= 4x^2(x^2 - 6x + 9) - 1(x^2 - 6x + 9) \\
 &= 4x^4 - 24x^3 + 36x^2 - x^2 + 6x - 9 \\
 &= 4x^4 - 24x^3 + 35x^2 + 6x - 9
 \end{aligned}$$

$$\begin{aligned}
 39. (x - 1)(x^3 + 2x^2 + 2) &= x(x^3 + 2x^2 + 2) - (x^3 + 2x^2 + 2) \\
 &= x^4 + 2x^3 + 2x - x^3 - 2x^2 - 2 \\
 &= x^4 + x^3 - 2x^2 + 2x - 2
 \end{aligned}$$

$$\begin{aligned}
 40. (x + 1)(5x^3 - x^2 + x - 4) &= x(5x^3 - x^2 + x - 4) + (5x^3 - x^2 + x - 4) \\
 &= 5x^4 - x^3 + x^2 - 4x + 5x^3 - x^2 + x - 4 \\
 &= 5x^4 + 4x^3 - 3x - 4
 \end{aligned}$$

$$\begin{aligned}
 41. (3x^2 - 2)(x^2 + 4x + 3) &= 3x^2(x^2 + 4x + 3) - 2(x^2 + 4x + 3) \\
 &= 3x^4 + 12x^3 + 9x^2 - 2x^2 - 8x - 6 \\
 &= 3x^4 + 12x^3 + 7x^2 - 8x - 6
 \end{aligned}$$

$$\begin{aligned}
 42. (-x^3 - 2)(x^2 + 3x - 3) &= -x^3(x^2 + 3x - 3) - 2(x^2 + 3x - 3) \\
 &= -x^5 - 3x^4 + 3x^3 - 2x^2 - 6x + 6
 \end{aligned}$$

$$\begin{aligned}
 43. (x^2 + x + 4)(2x^2 - x + 1) &= x^2(2x^2 - x + 1) + x(2x^2 - x + 1) + 4(2x^2 - x + 1) \\
 &= 2x^4 - x^3 + x^2 + 2x^3 - x^2 + x + 8x^2 - 4x + 4 \\
 &= 2x^4 + x^3 + 8x^2 - 3x + 4
 \end{aligned}$$

$$\begin{aligned}
 44. (x^2 - x - 3)(x^2 + 4x + 2) &= x^2(x^2 + 4x + 2) - x(x^2 + 4x + 2) - 3(x^2 + 4x + 2) \\
 &= x^4 + 4x^3 + 2x^2 - x^3 - 4x^2 - 2x - 3x^2 - 12x - 6 \\
 &= x^4 + 3x^3 - 5x^2 - 14x - 6
 \end{aligned}$$

$$\begin{aligned}
 45. (x + 9)(x - 2)(x - 7) &= (x^2 + 7x - 18)(x - 7) \\
 &= x(x^2 + 7x - 18) - 7(x^2 + 7x - 18) \\
 &= x^3 + 7x^2 - 18x - 7x^2 - 49x + 126 \\
 &= x^3 - 67x + 126
 \end{aligned}$$

$$\begin{aligned}
 46. (x + 3)(x - 4)(x - 5) &= (x^2 - x - 12)(x - 5) \\
 &= x(x^2 - x - 12) - 5(x^2 - x - 12) \\
 &= x^3 - x^2 - 12x - 5x^2 + 5x + 60 \\
 &= x^3 - 6x^2 - 7x + 60
 \end{aligned}$$

$$\begin{aligned}
 47. (x + 5)(x + 7)(-x + 1) &= (x^2 + 12x + 35)(-x + 1) \\
 &= -x(x^2 + 12x + 35) + (x^2 + 12x + 35) \\
 &= -x^3 - 12x^2 - 35x + x^2 + 12x + 35 \\
 &= -x^3 - 11x^2 - 23x + 35
 \end{aligned}$$

$$\begin{aligned}
 48. (2x - 3)(x^2 + 13x + 42) &= 2x(x^2 + 13x + 42) - 3(x^2 + 13x + 42) \\
 &= 2x^3 + 26x^2 + 84x - 3x^2 - 39x - 126 \\
 &= 2x^3 + 23x^2 + 45x - 126
 \end{aligned}$$

$$\begin{aligned}
 49. (x - 9)(x - 2)(3x + 2) &= (x^2 - 11x + 18)(3x + 2) \\
 &= 3x(x^2 - 11x + 18) + 2(x^2 - 11x + 18) \\
 &= 3x^3 - 33x^2 + 54x + 2x^2 - 22x + 36 \\
 &= 3x^3 - 31x^2 + 32x + 36
 \end{aligned}$$

$$\begin{aligned}
 50. (x - 1)(x - 8)(-2x - 5) &= (x^2 - 9x + 8)(-2x - 5) \\
 &= -2x(x^2 - 9x + 8) - 5(x^2 - 9x + 8) \\
 &= -2x^3 + 18x^2 - 16x - 5x^2 + 45x - 40 \\
 &= -2x^3 + 13x^2 + 29x - 40
 \end{aligned}$$

$$\begin{aligned}
 51. (2x + 1)(3x + 1)(x + 4) &= (2x + 1)(3x^2 + 13x + 4) \\
 &= 2x(3x^2 + 13x + 4) + (3x^2 + 13x + 4) \\
 &= 6x^3 + 26x^2 + 8x + 3x^2 + 13x + 4 \\
 &= 6x^3 + 29x^2 + 21x + 4
 \end{aligned}$$

$$\begin{aligned}
 52. (4x - 1)(2x - 1)(3x - 2) &= (8x^2 - 6x + 1)(3x - 2) \\
 &= 3x(8x^2 - 6x + 1) - 2(8x^2 - 6x + 1) \\
 &= 24x^3 - 18x^2 + 3x - 16x^2 + 12x - 2 \\
 &= 24x^3 - 34x^2 + 15x - 2
 \end{aligned}$$