

Section 4.5B

Factor each completely.

1) $25x^2 - 40x + 16$

2) $18r^2 + 60r + 50$

3) $4n^2 + 12n + 9$

4) $48x^2 - 24x + 3$

5) $9p^2 + 24p + 16$

6) $25r^2 + 30r + 9$

7) $25x^2 - 30x + 9$

8) $8a^3 + 1$

9) $4m^3 + 32$

10) $2x^3 - 432$

11) $128m^3 + 2$

12) $27 + 64x^3$

13) $125 + 216x^3$

14) $250 + 16m^3$

15) $8x^3 - 1$

16) $216 - x^3$

17) $2x^3 - 432$

18) $24 - 3x^3$

19) $648 - 3u^3$

20) $54 - 16m^3$

21) $7ah + 5ak + 28bh + 20bk$

22) $25xy + 20xr - 40ry - 32r^2$

23) $28mz - 7mc - 24nz + 6nc$

24) $7ab - 28a + 3b - 12$

Solve each equation by factoring.

25) $3a^2 + 4a - 15 = -8$

26) $2k^2 - 17k + 40 = 5$

27) $5m^2 - 19m = 4$

28) $18x^2 + 8 = 24x$

29) $4x^2 + 12x = -9$

30) $n^2 + 3 = 4$

31) $7p^2 - 119 = -7$

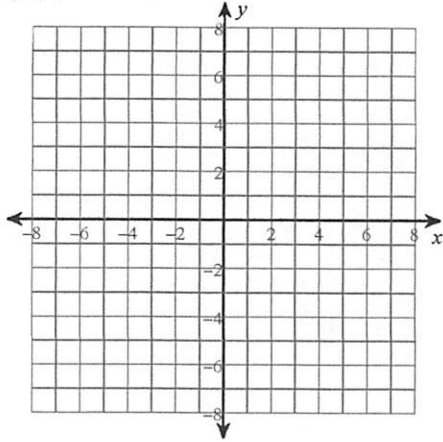
32) $m^2 - 33 = 3$

33) $125x^2 = 100x - 20$

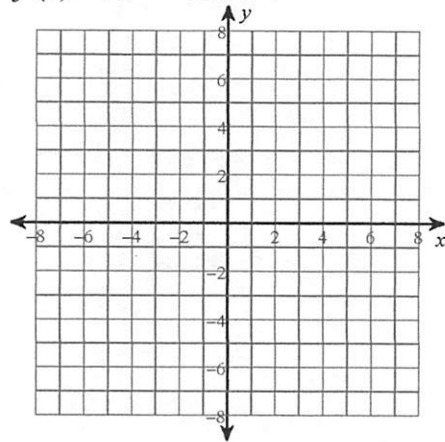
34) $3x^2 + 24x = -48$

Graph each function by finding the zeros and intercepts.

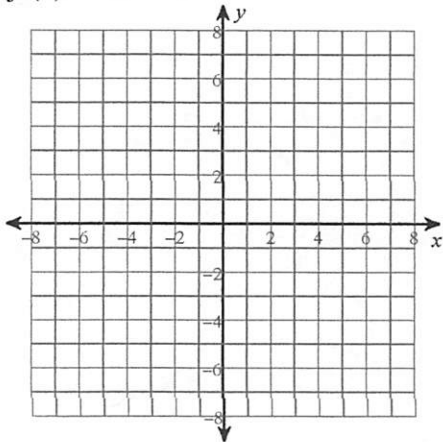
35) $f(x) = 4x^2 - 4x - 15$



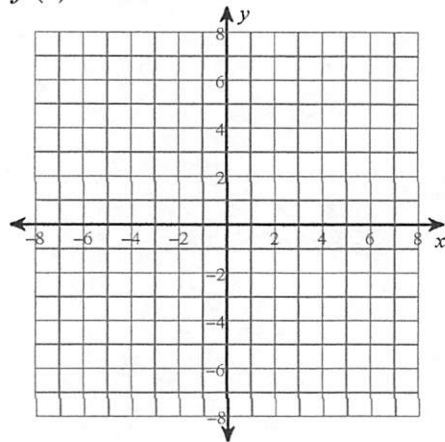
36) $f(x) = 9x^2 - 12x + 4$



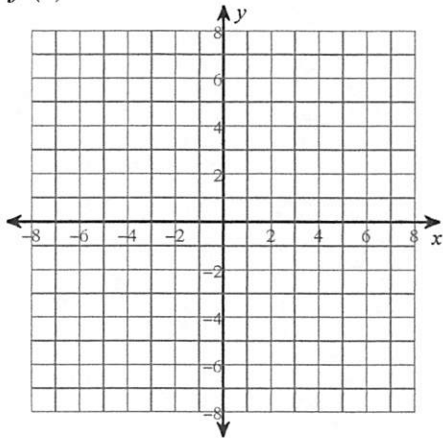
37) $f(x) = 4x^2 - 9$



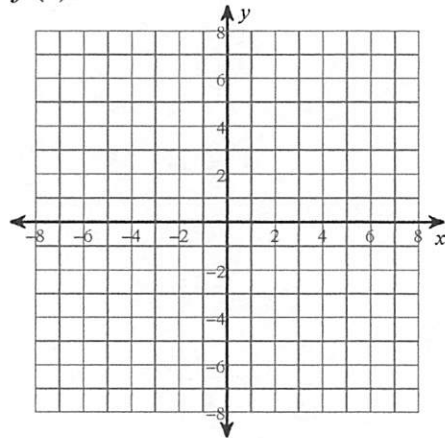
38) $f(x) = 3x^2 - 18x + 27$



39) $f(x) = 4x^2 - 8x - 5$



40) $f(x) = 3x^2 - 3$



Section 4.5B

Factor each completely.

1) $25x^2 - 40x + 16$

$$(5x-4)^2$$

3) $4n^2 + 12n + 9$

$$(2n+3)^2$$

5) $9p^2 + 24p + 16$

$$(3p+4)^2$$

7) $25x^2 - 30x + 9$

$$(5x-3)^2$$

9) $4m^3 + 32$

$$4(m^3+8)$$
$$4(m+2)(m^2+2m+4)$$

11) $128m^3 + 2$

$$2(64m^3+1)$$
$$2(4m+1)(16m^2-4m+1)$$

2) $18r^2 + 60r + 50$

$$2(9r^2 + 30r + 25)$$
$$2(3r+5)^2$$

4) $48x^2 - 24x + 3$

$$3(16x^2 - 8x + 1)$$
$$3(4x-1)^2$$

6) $25r^2 + 30r + 9$

$$(5r+3)^2$$

8) $8a^3 + 1$

$$(2a+1)(4a^2-2a+1)$$

10) $2x^3 - 432$

$$2(x^3-216)$$
$$2(x-6)(x^2+6x+36)$$

12) $27 + 64x^3$

$$(3+4x)(9-12x+16x^2)$$

13) $125 + 216x^3$

$$(5 + 6x)(25 - 30x + 36x^2)$$

14) $250 + 16m^3$

$$2(s + 2m)(25 - 10m + 4m^2)$$

15) $8x^3 - 1$

$$(2x - 1)(4x^2 + 2x + 1)$$

16) $216 - x^3$

$$(6 - x)(36 + 6x + x^2)$$

17) $2x^3 - 432$

$$2(x - 6)(x^2 + 6x + 36)$$

18) $24 - 3x^3$

$$3(2 - x)(4 + 2x + x^2)$$

19) $648 - 3u^3$

$$3(6 - u)(36 + 6u + u^2)$$

20) $54 - 16m^3$

$$2(3 - 2m)(9 + 6m + 4m^2)$$

21) $7ah + 5ak + 28bh + 20bk$

$$(a + 4b)(7h + 5k)$$

22) $25xy + 20xr - 40ry - 32r^2$

$$(5x - 8r)(5y + 4r)$$

23) $28mz - 7mc - 24nz + 6nc$

$$(7m - 6n)(4z - c)$$

24) $7ab - 28a + 3b - 12$

$$(7a + 3)(b - 4)$$

Solve each equation by factoring.

25) $3a^2 + 4a - 15 = -8$

$$\left\{-\frac{7}{3}, 1\right\}$$

26) $2k^2 - 17k + 40 = 5$

$$\left\{\frac{7}{2}, 5\right\}$$

27) $5m^2 - 19m = 4$

$$\left\{-\frac{1}{5}, 4\right\}$$

28) $18x^2 + 8 = 24x$

$$\begin{aligned} 18x^2 - 24x + 8 &= 0 \\ 2(9x^2 - 12x + 4) &= 0 \\ 2(3x - 2)^2 &= 0 \\ \left\{\frac{2}{3}\right\} \end{aligned}$$

29) $4x^2 + 12x = -9$

$$\begin{aligned} 4x^2 + 12x + 9 &= 0 \\ (2x + 3)^2 & \\ \left\{-\frac{3}{2}\right\} \end{aligned}$$

30) $n^2 + 3 = 4$

$$\{-1, 1\}$$

31) $7p^2 - 119 = -7$

$$\{-4, 4\}$$

32) $m^2 - 33 = 3$

$$\{-6, 6\}$$

33) $125x^2 = 100x - 20$

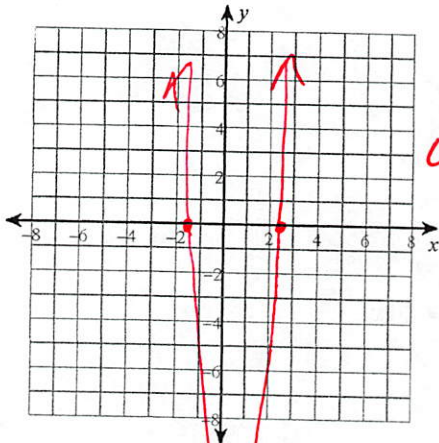
$$\begin{aligned} 125x^2 - 100x + 20 &= 0 \\ 5(25x^2 - 20x + 4) &= 0 \\ 5(5x - 2)^2 &= 0 \\ \left\{\frac{2}{5}\right\} \end{aligned}$$

34) $3x^2 + 24x = -48$

$$\begin{aligned} 3x^2 + 24x + 48 &= 0 \\ 3(x^2 + 8x + 16) &= 0 \\ 3(x + 4)^2 &= 0 \\ \{-4\} \end{aligned}$$

Graph each function by finding the zeros and intercepts.

35) $f(x) = 4x^2 - 4x - 15$

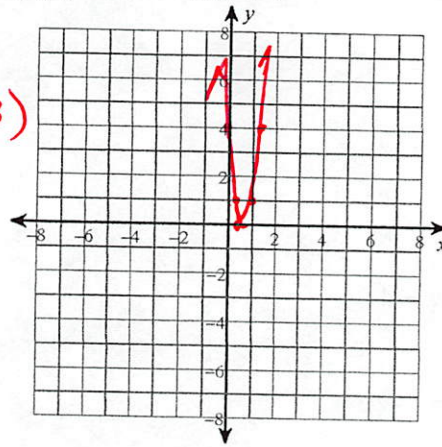


$0 = (2x-5)(2x+3)$

$\frac{1}{2} \mid -16$

$x = \left\{ -\frac{3}{2}, \frac{5}{2} \right\}$

36) $f(x) = 9x^2 - 12x + 4$

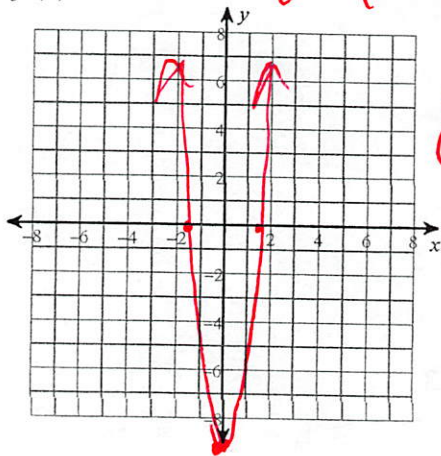


$0 = (3x-2)^2$

$\left\{ \frac{2}{3} \right\}$

$\frac{1}{3} \mid 4$

37) $f(x) = 4x^2 - 9$

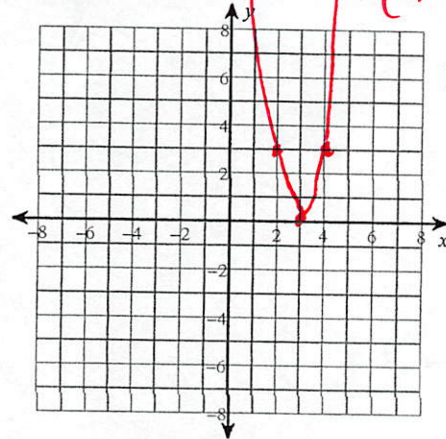


$0 = (2x+3)(2x-3)$

$\left\{ -\frac{3}{2}, \frac{3}{2} \right\}$

$0 \mid -9$

38) $f(x) = 3x^2 - 18x + 27$



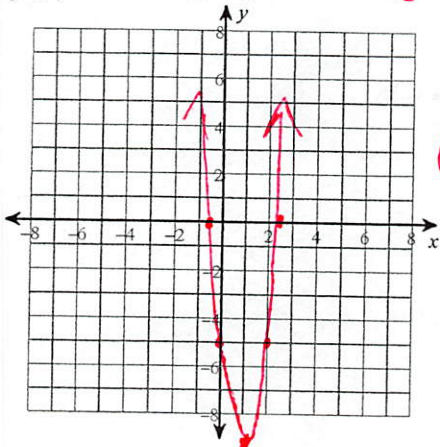
$3(x^2 - 6x + 9) = 0$

$3(x-3)^2 = 0$

$\{ 3 \}$

$\frac{4}{2} \mid 3$
 $1 \mid 12$

39) $f(x) = 4x^2 - 8x - 5$

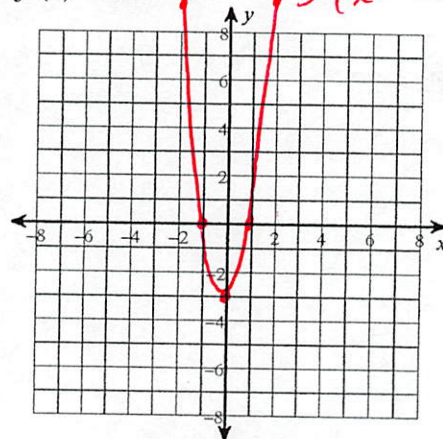


$0 = (2x+1)(2x-5)$

$\left\{ -\frac{1}{2}, \frac{5}{2} \right\}$

$0 \mid -5$
 $1 \mid -9$
 $2 \mid -5$

40) $f(x) = 3x^2 - 3$



$3(x^2 - 1)$

$0 = 3(x+1)(x-1)$

$\{ -1, 1 \}$

$x \mid 8$
 $0 \mid -3$
 $2 \mid 9$
 $-2 \mid 9$