SECTION 6-2

EXERCISE A

Factor completely.

1) $-12x^2 - 6x$

2) $a^2 + 5a + ab$

3) $21 - 7y + 3x - xy$

4) $y^2 + 4y + 2y + 8$

5) $z^2 - 4z - 12$

6) $3b^2 - 48$

7) $16w^2 - 169$

8) $h^3 + 8000$

Determine if the following expressions can be rewritten or factored so that they contain a quadratic factor. (y/n)

9) $5y^4 + 7y^3 - 8$

10) $84n^4 - 62n^2$

11) $p^{\frac{3}{2}} + 7p^{\frac{3}{4}} + 12$

12) $3r^9 - r^3 + 1$

Solve each equation.

13) $2z^3 + 8z^2 = 0$

14) $g^3 + 7g^2 - 4g - 28 = 0$

15) $x^4 - 50x^2 + 49 = 0$

16) $x^3 - 125 = 0$

17) $x^4 + 24x^2 = -144$

18) $5x^3 - 4x^2 + 5x = 4$

EXERCISE B

Factor completely. If the polynomial cannot be factored, write *prime*.

19) $2xy^3 - 10x$

20) $6a^2b^2 + 18ab^3$

21) $12cd^3 - 8c^2d^2 + 10c^5d^3$

22) $3a^2bx + 15cx^2y + 25ad^3y$

23) $8yz - 6z - 12y + 9$

24) $3ax - 15a + x - 5$

25) $y^2 - 5y + 4$

26) $2b^2 + 13b - 7$

27) $z^3 + 125$

28) $2t^3 - 16$

Determine if the following expressions can be rewritten or factored so that they contain a quadratic factor. (y/n)

29) $6x^{\frac{2}{5}} - 4x^{\frac{1}{5}} - 16$

30) $7x^{\frac{1}{9}} - 3x^{\frac{1}{3}} + 4$

31) $7b^5 - 4b^3 + 2b$

32) $a^8 + 10a^2 - 16$

Solve each equation.

33) $x^4 - 34x^2 + 225 = 0$

34) $x^4 - 15x^2 - 16 = 0$

35) $x^4 + 6x^2 - 27 = 0$

36) $x^3 + 64 = 0$

37) $27x^3 + 1 = 0$

38) $5x^5 - 45x^3 = 0$

39) $5c^3 - 4c^2 + 5c = 4$

40) $y^4 + 24y^2 = -144$

EXERCISE C

41) Jill is designing a picture frame for an art project. She plans to have a square piece of glass in the center and surround it with a decorated ceramic frame, which will also be a square. The dimensions of the glass and frame are shown in the diagram to the right.
Jill determines that she needs 27 square inches of material for the frame.

a) Write a polynomial equation (in simplest form) that models the area of the frame.

b) What are the dimensions of the glass piece?

c) What are the dimensions of the frame?

ANSWERS:

1) $-6x(2x + 1)$
3) $(x + 7)(3 - y)$
5) $(z - 6)(z + 2)$
7) $(4w + 13)(4w - 13)$
9) no
11) yes
13) $z = -4, 0$
15) $x = \pm 7, \pm 1$
17) $x = \pm 2i\sqrt{3}$
19) $2x(y^3 - 5)$
21) $2cd^2(6d - 4c + 5c^4d)$
23) $(2z - 3)(4y - 3)$
25) $(y - 1)(y - 4)$
27) $(z + 5)(z^2 - 5z + 25)$
29) yes
31) yes
33) $x = \pm 5, \pm 3$
35) $x = \pm 3i, \pm 1.7$
37) $x = -1/3, 0.2 \pm 0.3i$
39) $c = 4/5, \pm i$
41a) $x^4 - 7x^2 + 9 = 27$
b) 3in. x 3in.
c) 6in. x 6in.