Chapter 1: Factoring and Quadratic Equations

Section 1.1: The Greatest Common Factor

#1-16: Factor out the GCF.

1) $2y - 10$

2) $6x - 12$

3) $14x^3 - 7x^2 + 7x$

4) $25y^3 - 20y^2 + 5y$

5) $b^5 - 3b^4 + b^3$

6) $x^3 - x^2 + 9x$

7) $12x^4 - 3x^3$

8) $3y^3 - y^2$

9) $4x^3y + 12x^2y^3$

10) $15x^4y^2 - 10x^3y^4$

11) $16a^4b^2 - 18ab^3$

12) $32a^2b^6 - 24ab^7$

13) $12xyz^3 - 14x^2y^3 - 2xz$

14) $15x^3yz + 9x^2y^3z^2 - 6yz$

15) $16r^2st^3 - 4r^3st^2 + 12rst$

16) $8r^3st^2 + 6r^3s^2t - 10rst$

#17-26: Factor out a (-1) from each polynomial.

17) $-x + 2$

18) $-3x + 5$

19) $-x - 3$

20) $-x - 4$

21) $-5x + 9$

22) $-7w + 16$

23) $-3x + 6y - 7$

24) $-2x - 3y + 9$

25) $-4x + 6z + 11s$

26) $-13y + 4z - 11r$

#27-38: Factor each polynomial by factoring out the opposite of the GCF.

27) $-4x^3 - 12x^2$

28) $-20y^2 - 15y$

29) $-12x^3 + 4x^2 - 8x$

30) $-42a^5 + 24a^3 - 4a$

31) $-3z + 6z^3$

32) $-5y + 10y^2$

33) $-14a^4b^2 - 6a^2b$

34) $-2a^2b^2 - 4ab^3$

35) $-8xyz^3 - 4x^2y^3 + 2xyz$

36) $-15x^2yz + 12x^2y^3z^3 - 9xyz$

37) $-16r^2st^3 - 4r^3st^2 - 12rst^2$

38) $-8r^3st^2 - 6r^3s^2t - 10rst$

Chapter 1: Factoring and Quadratic Equations

Section 1.1: The Greatest Common Factor

#39 – 52: Factor out the GCF

39) $x(x-4) + 3(x-4)$

40) $x(x-5) + 2(x-5)$

41) $x^2(y-2) - 3(y-2)$

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

43) $3y(z+1) - 4(z+1)$

44) $6y(z+7) - 5(z+7)$

45) $x(3x-4) - 2(3x-4)$

46) $x(5x+1) - 4(5x+1)$

47) $3x(2x-7) + 4(2x-7)$

48) $5x(6x-1) + 6(6x-1)$

49) $2x^2(3x-5y) - 5(3x-5y)$

50) $7x^2(2x-3y) - 4(2x-3y)$

51) $8y(y-5) - 9(y-5)$

52) $7y(y+4) - 2(y+4)$

Chapter 1: Factoring and Quadratic Equations

Section 1.2: Factoring by Grouping

#1 – 36: Factor by Grouping, state if a polynomial is prime

1) $x^2 + 5x + 2x + 10$

2) $x^2 + 3x + 4x + 12$

3) $x^2 - 5x - 2x + 10$

4) $x^2 - 3x - 4x + 12$

5) $x^2 + 9x + 4x + 36$

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

7) $x^2 - 9x - 4x + 36$

8) $x^2 - x - 36x + 36$

9) $y^2 + 10y + 3y + 30$

10) $y^2 + 6y + 5y + 30$

11) $y^2 - 10y - 3y + 30$

12) $y^2 - 6y - 5y + 30$

13) $5x^2 + 5x + 6x + 6$

14) $5x^2 + 10x + 3x + 6$

15) $5x^2 - 5x - 6x + 6$

16) $5x^2 - 10x - 3x + 6$

17) $4y^2 + 3y + 4y + 3$

18) $4y^2 + 12y + y + 3$

19) $4y^2 - 3y - 4y + 3$

20) $4y^2 - 12y - y + 3$

21) $2z^2 - 2z + 7z - 7$

22) $2z^2 + 14z - z - 7$

23) $2z^2 + 7z - 2z - 7$

24) $2z^2 - 14z + z - 7$

25) $x^3 + 2x^2 + 6x + 12$

26) $y^3 + 8y^2 + 4y + 32$

27) $x^3 + 6x + 3x^2 + 18$

28) $z^3 + 5z + 10z^2 + 50$

29) $y^3 + 4y^2 + y + 4$

30) $x^3 + 4x^2 + x + 4$

31) $z^3 + 5z^2 - z - 5$

32) $x^3 + 9x^2 - x - 9$

33) $5x^3 + 4x^2 + 10x + 8$

34) $8x^3 - 2x^2 + 20x - 5$

35) $7t^3 + 5t^2 + 21t + 15$

36) $4x^3 + 5x^2 + 12x + 15$

Chapter 1: Factoring and Quadratic Equations

You have to know your multiplication tables very well for the next two sections. This table may help a bit.

12 1*12 2*6 3*4	**24** 1*24 2*12 3*8 4*6	**34** 1*34 2*17	**46** 1*46 2*23	**58** 1*58 2*29	**70** 1*70 2*35 5*14 7*10	**82** 1*82 2*41
14 1*14 2*7	**25** 1*25 5*5	**35** 1*35 5*7	**48** 1*48 2*24 3*16 4*12 6*8	**60** 1*60 2*30 3*20 4*15 5*12 6*10	**72** 1*72 2*36 4*18 8*9	**100** 1*100 2*50 4*25 5*20 10*10
15 1*15 3*5	**26** 1*26 2*13	**36** 1*36 2*18 3*12 4*9 6*6	**50** 1*50 2*25 5*10	**62** 1*62 2*31	**74** 1*74 2*37	**121** 1*121 11*11
16 1*16 2*8 4*4	**27** 1*27 3*9	**38** 1*38 2*19	**52** 1*52 2*26 4*13	**63** 1*63 3*21 7*9	**75** 1*75 3*25 5*15	**144** 1*144 6*24 2*72 8*18 3*48 9*16 4*36 12*12
18 1*18 2*9 3*6	**28** 1*28 2*14 4*7	**40** 1*40 2*20 4*10 5*8	**54** 1*54 2*27 3*18 6*9	**64** 1*64 2*32 4*16 8*8	**76** 1*76 2*38 4*19	**169** 1*169 13*13
20 1*20 2*10 4*5	**30** 1*30 2*15 3*10 5*6	**42** 1*42 2*21 3*14 6*7	**55** 1*55 5*11	**65** 1*65 5*13	**77** 1*77 7*11	**225** 1*225 15*15 3*75 5*45 9*25
21 1*21 3*7	**32** 1*32 2*16 4*8	**44** 1*44 2*22 4*11	**56** 1*56 2*28 4*14 7*8	**66** 1*66 2*33 3*22 6*11	**78** 1*78 2*39 3*26 6*13	
22 1*22 2*11	**33** 1*33 3*11	**45** 1*45 3*15 5*9	**57** 1*57 3*19	**68** 1*68 2*34 4*17	**80** 1*80 2*40 4*20 5*16 8*10	

Chapter 1: Factoring and Quadratic Equations

Section 1.3:   Factoring Trinomials of the Form $x^2 + bx + c$

#1 – 28: Rewrite as a polynomial with 4 terms (if possible) then factor by grouping and check your answer, state if a polynomial is prime.

1) $x^2 + 5x + 6$

2) $x^2 + 7x + 6$

3) $x^2 - 5x + 6$

4) $x^2 - 7x + 6$

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

6) $y^2 + 4y + 4$

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

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

9) $z^2 + 13z + 36$

10) $z^2 + 15z + 36$

11) $z^2 - 13z + 36$

12) $z^2 - 15z + 36$

13) $x^2 + 5x - 6$

14) $x^2 + x - 6$

15) $x^2 - 5x - 6$

16) $x^2 - x - 6$

17) $x^2 + 4x - 12$

18) $x^2 + x - 12$

19) $x^2 - 4x - 12$

20) $x^2 - x - 12$

21) $x^2 + 7x + 2$

22) $x^2 + 5x + 2$

23) $x^2 - 7x + 2$

24) $x^2 - 5x + 2$

25) $y^2 + 3y - 11$

26) $y^2 + 2y - 11$

27) $y^2 - 3y - 11$

28) $y^2 - 2y - 11$

#29-58: Factor each trinomial without grouping, state if a polynomial is prime.

29) $x^2 + 11x + 18$

30) $y^2 + 15y + 50$

31) $c^2 + 12c + 20$

32) $b^2 + 6b + 9$

33) $r^2 + 6r + 8$

34) $x^2 + 13x + 36$

35) $y^2 - 10y + 16$

36) $z^2 - 7z + 12$

37) $x^2 - 9x + 20$

38) $y^2 - 5y + 6$

Chapter 1: Factoring and Quadratic Equations

Section 1.3:   Factoring Trinomials of the Form $x^2 + bx + c$

#29 – 58 continued:

39) $x^2 - 2x + 3$ 40) $y^2 - 12y + 11$

41) $b^2 + 4b - 5$ 42) $a^2 + 7a - 8$

43) $z^2 + 5z - 6$ 44) $z^2 + 10z - 24$

45) $x^2 + 4x - 12$ 46) $x^2 + 3x - 10$

47) $x^2 - 2x - 15$ 48) $y^2 - 10y - 24$

49) $a^2 - 9a - 22$ 50) $a^2 - 5a - 14$

51) $x^2 - 6x - 16$ 52) $x^2 - 8x - 20$

53) $x^2 + 2x + 8$ 54) $x^2 + 9x + 5$

55) $y^2 - 2y + 5$ 56) $y^2 - 3y + 8$

57) $x^2 - 5x - 9$ 58) $x^2 - 2x - 11$

#59-74: Factor each trinomial. Make sure to factor out a negative or the GCF where applicable.

59) $-x^2 - 7x - 10$ 60) $-y^2 - y + 30$

61) $-w^2 + 18w - 77$ 62) $-b^2 + 14b - 33$

63) $3x^2 + 12x - 36$ 64) $6y^2 + 30y + 24$

65) $6z^2 - 30z + 24$ 66) $4x^2 + 40x - 44$

67) $x^3 + 6x^2 - 7x$ 68) $y^3 - 5y^2 + 6y$

69) $-2x^3 - 10x^2 + 12x$ 70) $-2y^3 - 10y^2 + 48y$

71) $20y + 18 + 2y^2$ 72) $10y - 28 + 2y^2$

73) $30z + 3z^2 + 45$ 74) $9z + 3z^2 - 54$

Chapter 1: Factoring and Quadratic Equations

Section 1.4: Factoring Trinomials in the Form $ax^2 + bx + c$ where a $\neq$ 1

#1 – 18: Rewrite as a polynomial with 4 terms (if possible) then factor by grouping and check your answer, state if a polynomial is prime.

1) $5x^2 + 11x + 6$

2) $5x^2 + 13x + 6$

3) $5x^2 - 11x + 6$

4) $5x^2 - 13x + 6$

5) $4x^2 + 7x + 3$

6) $4y^2 + 13y + 3$

7) $4x^2 - 7x + 3$

8) $4y^2 - 13y + 3$

9) $2z^2 + 5z - 7$

10) $2z^2 + 13z - 7$

11) $2z^2 - 5z - 7$

12) $2z^2 - 13z - 7$

13) $6x^2 + 23x + 7$

14) $6x^2 + 23x + 4$

15) $3x^2 + 10x + 7$

16) $5x^2 + 12x + 7$

17) $5x^2 + 13x + 6$

18) $6x^2 + 23x + 7$

#19-44: Factor, using bottoms up or the guess and check method, state if a polynomial is prime (notice #19 – 30 are the same as #1-12, and you should get the same answer regardless of the technique you use to factor.)

19) $5x^2 + 11x + 6$

20) $5x^2 + 13x + 6$

21) $5x^2 - 11x + 6$

22) $5x^2 - 13x + 6$

23) $4x^2 + 7x + 3$

24) $4y^2 + 13y + 3$

25) $4x^2 - 7x + 3$

26) $4y^2 - 13y + 3$

27) $2z^2 + 5z - 7$

28) $2z^2 + 13z - 7$

29) $2z^2 - 5z - 7$

30) $2z^2 - 13z - 7$

31) $3x^2 - 11x + 10$

32) $10x^2 + 19x + 6$

33) $2b^2 - 15b + 7$

34) $3w^2 - 14w + 8$

35) $6y^2 - 7y - 5$

36) $8y^2 - 6y - 5$

37) $8a^2 + a - 7$

38) $4x^2 + 4x - 15$

Chapter 1: Factoring and Quadratic Equations

#19 – 44: Continued

39) $2x^2 - 5x - 7$

40) $8y^2 - 5y - 3$

41) $3x^2 + 5x + 6$

42) $7x^2 + x + 3$

43) $2x^2 + 5x - 8$

44) $3x^2 + 7x + 8$

#45-64: Factor out the GCF and then factor by bottoms up or the guess and check method.

45) $4m^2 + 34m - 18$

46) $15n^2 + 36n + 21$

47) $4z^3 - 13z^2 + 3z$

48) $8x^3 - 22x^2 + 5x$

49) $20x^3 - 18x^2 + 4x$

50) $18y^3 - 39y^2 + 6y$

51) $-16x^2 + 44x - 10$

52) $-20x^2 + 18x - 4$

53) $18x^2 - 21x - 15$

54) $16x^2 - 12x - 10$

55) $18x^3 - 21x^2 - 15x$

56) $16x^3 - 12x^2 - 10x$

57) $-18x^2 + 21x + 15$

58) $-16x^2 + 12x + 10$

59) $12x^2 + 10x + 12$

60) $21x^2 + 3x + 9$

61) $3x^3 + 5x^2 + 6x$

62) $8y^3 - 5y^2 + y$

63) $4b^3 + 6b^2 - 6b$

64) $8a^3 + 12a^2 - 6a$

Chapter 1: Factoring and Quadratic Equations

Section 1.5: Factoring Sums and Differences of Squares

#1- 42: Completely factor the binomials, remember to factor out the GCF first when applicable (if a problem is prime say so).

1) $x^2 - 9$

2) $y^2 - 81$

3) $x^2 + 9$

4) $y^2 + 81$

5) $y^2 - 36$

6) $b^2 - 49$

7) $y^2 + 36$

8) $b^2 + 49$

9) $25a^2 - 81$

10) $16b^2 - 49$

11) $25a^2 + 81$

12) $16b^2 + 49$

13) $49x^2 - 36$

14) $81x^2 - 25$

15) $49x^2 + 36$

16) $81x^2 + 49$

17) $x^3 - 64x$

18) $x^5 - 121x^3$

19) $x^3 + 64x$

20) $x^5 + 121x^3$

21) $3x^2 - 27$

22) $2b^2 - 98$

23) $3x^2 + 27$

24) $2b^2 + 98$

25) $9 - 25x^2$

26) $49 - 16y^2$

27) $81 - 16x^2$

28) $121 - 144x^2$

29) $x^4 - 9$

30) $x^4 - 25$

31) $16x^4 - 25$

32) $81x^4 - 16$

33) $98y^2 - 2x^4$

34) $50x^4 - 128y^2$

35) $x^4 - 16$

36) $y^4 - 81$

37) $2x^4 - 512$

38) $2x^4 - 1250$

39) $y^4 - 2401$

40) $y^4 - 4096$

41) $x^4 + 4$

42) $y^2 + 9$

Chapter 1: Factoring and Quadratic Equations

Section 1.6: Factoring Sums and Differences of Cubes

#1-42: Completely factor the binomials, remember to factor out the GCF first when applicable (if a problem is prime say so).

1) $x^3 + 8$

2) $y^3 + 64$

3) $x^3 - 8$

4) $y^3 - 64$

5) $b^3 + 27$

6) $x^3 + 125$

7) $b^3 - 27$

8) $x^3 - 125$

9) $x^3 + 64$

10) $y^3 + 27$

11) $x^3 - 64$

12) $y^3 + 27$

13) $8x^3 - 27$

14) $125x^3 - 64$

15) $8x^3 + 27$

16) $125x^3 + 64$

17) $27x^3 - 125$

18) $64x^3 - 27$

19) $64x^3 - y^3$

20) $27x^3 - y^3$

21) $x^6 - y^3$

22) $y^6 - x^3$

23) $27x^6 - 1$

24) $64x^6 - 1$

25) $125x^9 - y^6$

26) $8x^9 - y^3$

27) $16x^3 - 54$

28) $3x^3 - 81$

29) $3x^3 + 24$

30) $2x^3 + 128$

31) $x^4 - 8x$

32) $y^4 - 64y$

33) $6x^4 - 48x$

34) $3y^4 - 192y$

35) $8x^5 + 125x^2$

36) $3x^5 - 375x^2$

37) $27 - x^3$

38) $64 - y^3$

39) $27 + 64x^3$

40) $125 + 8x^3$

41) $8 + y^6$

42) $64 + x^9$

Chapter 1: Factoring and Quadratic Equations

Section 1.7: A Review of all the Factoring Strategies – Mixed Up

#1-44: Factor completely, state if a polynomial is prime.

1) $a^2 + 16$

2) $b^2 + 25$

3) $81y^2 - 4$

4) $121x^2 - 144$

5) $b^3 + 64$

6) $x^3 + 1$

7) $64x^3 - 1$

8) $27x^3 - 64$

9) $2x^2 - 3x - 9$

10) $8y^2 - 10y - 3$

11) $-4x^2 + 6x + 18$

12) $-16x^2 + 20x + 6$

13) $3x^2 - 13x + 10$

14) $5x^2 - 23x + 12$

15) $-w^2 + 8w - 15$

16) $-b^2 + 7b - 12$

17) $x^2 - 2x + 15$

18) $y^2 - 10y + 24$

19) $5x^2 + 10x + 6x + 12$

20) $5x^2 + 30x + 3x + 18$

21) $x^2 + 5x + 9$

22) $x^2 + 4x + 7$

23) $6x^4 - 6x$

24) $3y^4 - 3y$

25) $2x^2 - 8$

26) $3b^2 - 12$

27) $3x^2 + 12$

28) $2b^2 + 8$

29) $3x^2 - 5x - 6x + 10$

30) $2x^2 - 3x - 8x + 12$

31) $x^2 + x + 24x + 24$

32) $x^2 + x + 12x + 12$

33) $6x^2 + 13x + 6$

34) $2x^2 + 9x + 9$

35) $-x^2 + 5x + 6$

36) $-x^2 - 5x + 6$

37) $-3x^2 - 12x + 36$

38) $-6y^2 - 30y - 24$

39) $z^2 - 5z + 4$

40) $x^2 + 10x - 11$

41) $x^2 - 14x - 15$

42) $y^2 - 23y - 24$

43) $a^2 - a - 2$

44) $a^2 - 2a - 3$

Chapter 1: Factoring and Quadratic Equations

Section 1.8 Solving Quadratic Equations by Factoring

#1 - 21: Solve each equation.

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

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

3) $(x - 1)(x - 7) = 0$

4) $(x - 9)(x - 10) = 0$

5) $(3x + 12)(2x - 8) = 0$

6) $(2x - 12)(3x + 15) = 0$

7) $(2x - 9)(3x + 10) = 0$

8) $(5x + 4)(2x - 3) = 0$

9) $(5x - 7)(3x - 11) = 0$

10) $3x(x - 4)(x + 5) = 0$

11) $7x(x - 1)(x + 2) = 0$

12) $4x(2x - 10)(3x + 15) = 0$

13) $5x(2x + 10)(4x + 20) = 0$

14) $x(x + 1)(x + 2) = 0$

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

16) $x(7x - 10)(3x - 16) = 0$

17) $7(x - 1)(x - 2) = 0$

18) $4(x - 3)(x + 5) = 0$

19) $2(5x - 30)(3x + 18) = 0$

20) $11(4x - 1)(3x–5) = 0$

21) $6(2x - 9)(5x - 1) = 0$

#22 - 42: Solve each equation.

22) $x^2 - 5x + 6 = 0$

23) $x^2 - 14x + 45 = 0$

24) $x^2 + 6x - 7 = 0$

25) $x^2 - 5x - 6 = 0$

26) $y^2 - 81 = 0$

27) $b^2 - 25 = 0$

28) $25x^2 - 16 = 0$

29) $49y^2 - 16 = 0$

30) $3x^2 + 5x + 2 = 0$

31) $5x^2 + 9x + 4 = 0$

32) $2x^2 + 3x + 1 = 0$

33) $3x^2 - 5x - 2 = 0$

34) $5x^2 + 12x + 4 = 0$

35) $2x^2 + 5x + 3 = 0$

36) $3x^2 - x - 2 = 0$

37) $x^2 - x - 6 = 0$

38) $x^2 + 11x + 10 = 0$

39) $25y^2 - 81 = 0$

40) $16b^2 - 25 = 0$

41) $3y^2 + 5y - 2 = 0$

42) $6x^2 - x - 5 = 0$

Chapter 1: Factoring and Quadratic Equations

Section 1.8 Solving Quadratic Equations by Factoring

#43 - 60: Solve each equation. (Remember to factor out the GCF first)

43) $3x^3 + 5x^2 + 2x = 0$

44) $10x^3 + 18x^2 + 8x = 0$

45) $4x^2 + 2x - 6 = 0$

46) $3x^2 + 18x - 21 = 0$

47) $5x^2 - 20 = 0$

48) $2x^2 - 18 = 0$

49) $3x^3 - 15x^2 + 18x = 0$

50) $2x^3 - 28x^2 + 90x = 0$

51) $3x^2 - 15x - 18 = 0$

52) $2x^2 - 28x + 90 = 0$

53) $10x^2 + 18x + 8 = 0$

54) $14x^2 + 35x + 21 = 0$

55) $10x^3 + 18x^2 + 8x = 0$

56) $14x^3 + 35x^2 + 21x = 0$

57) $-2x^2 + 10x + 12 = 0$

58) $-3x^2 - 18x + 21 = 0$

59) $x^3 - 49x = 0$

60) $y^3 - 25y = 0$

#61 - 78: Solve each equation.

61) $r(r + 1) = 12$

62) $x(x - 1) = 6$

63) $x(x - 4) = -3$

64) $y(y - 5) = -4$

65) $(x - 2)(x - 3) = 6$

66) $(x - 1)(x - 2) = 12$

67) $(x + 1)(x - 4) = 6$

68) $(z + 3)(z - 4) = 8$

69) $3x(x + 1) = 6$

70) $4x(x - 4) = -12$

71) $(2x - 3)(x + 2) = 4$

72) $(3x - 4)(x - 5) = -6$

73) $x(x - 3) + 2 = 30$

74) $3x(x - 1) - 4 = 2$

75) $2x(x - 3) = 5x(x - 4) + 8$

76) $2(3 - 4x) = x(x - 1) - 2$

77) $x(x - 4) + 1 = x + 7$

78) $x(x - 3) + 4 = 3x - 4$

Chapter 1: Factoring and Quadratic Equations

Section 1.9: Applications that involve factoring

1) A number is 20 less than its square. Find all such numbers.

2) A number is 12 less than its square. Find all such numbers.

3) The square of a number is 6 more than the number. Find all such numbers.

4) The square of a number is 12 more than the number. Find all such numbers.

5) The product of two consecutive numbers is 72. Find all such numbers.

6) The product of two consecutive numbers is 20. Find all such numbers.

7) The product of two consecutive even numbers is 24. Find all such numbers.

8) The product of two consecutive even numbers is 48. Find all such numbers.

9) The product of two consecutive odd numbers is 63. Find all such numbers.

10) The product of two consecutive odd numbers is 15. Find all such numbers.

11) The length of a rectangular bedroom is 2 feet longer than its width. The area of the bedroom is 120 square feet. Find the dimensions of the room.

12) The length of a rectangular bedroom is 3 feet longer than its width. The area of the bedroom is 108 square feet. Find the dimensions of the room.

13) A rectangular garden is 4 feet narrower than it is long. The garden has an area of 32 square feet. Find the dimensions of the garden.

14) A rectangular garden is 3 feet narrower than it is long. The garden has an area of 54 square feet. Find the dimensions of the garden.

15) The base of a triangle is 2 feet longer than its height. The area of the triangle is 7.5 square feet. Find the height of the triangle.

16) The base of a triangle is 1 foot longer than its height. The area of the triangle is 10 square feet. Find the height of the triangle.

Chapter 1: Factoring and Quadratic Equations

Section 1.9: Applications that involve factoring

17) The height of a triangle is 2 feet shorter than its base. The area of the triangle is 17.5 square feet. Find the height of the triangle.

18) The height of a triangle is 3 feet shorter than its base. The area of the triangle is 20 square feet. Find the height of the triangle.

19) The length of the hypotenuse of a right triangle is 8 inches more than the shortest leg. The length of the longer leg is 7 inches more than the length of the shorter leg. Find the length of each side of the triangle.

20) The length of the hypotenuse of a right triangle is 4 inches more than the shortest leg. The length of the longer leg is 2 inches more than the length of the shorter leg. Find the length of each side of the triangle.

21) The length of a hypotenuse of a right triangle is 1 foot more than the longer leg. The length of the shorter leg is 1 foot less than the length of the longer leg. Find the length of each side of the right triangle.

22) The length of a hypotenuse of a right triangle is 2 foot more than the longer leg. The length of the shorter leg is 2 foot less than the length of the longer leg. Find the number length of each side of the right triangle.

23) The length of the hypotenuse in a right triangle is 15 inches. The shortest leg is 3 inches shorter than the length of the longest leg. Find the length of each of the legs.

24) The length of the hypotenuse in a right triangle is 10 inches. The shortest leg is 2 inches shorter than the length of the longest leg. Find the length of each of the legs.

25) The length of the short leg in a right triangle is 3 inches. The longest leg is 1 inch less than the length of the hypotenuse. Find the length of each of the each unknown side.

26) The length of the short leg in a right triangle is 5 inches. The longest leg is 1 inch less than the length of the hypotenuse. Find the length of each of the each unknown side.

Chapter 1: Factoring and Quadratic Equations

Chapter 1: Review

1) Completely factor the polynomial. State if a polynomial is prime.

a) $x^2 + 7x - 18$

b) $z^2 - 13z + 36$

c) $-y^2 + 5y + 14$

d) $-2y^3 - 10y^2 + 48y$

e) $6x^2 + 13x + 5$

f) $x^2 + 2x + 3$

g) $9n^2 + 24n + 15$

h) $4x^3 - 16x^2 - 84x$

i) $25b^2 - 81$

j) $x^2 + 64$

k) $x^3 + 125$

l) $27y^3 - 64$

m) $5m^2 + m - 6$

n) $3n^2 + 7n + 2$

o) $-3x^3 - 21x^2 + 54x$

p) $2b^2 + 3b + 5$

q) $x^2 + 5x + 2x + 10$

r) $5x^2 + 10x - 3x - 6$

2) Solve each equation.

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

b) $(x + 2)(3x - 10) = 0$

c) $x^2 - 3x - 10 = 0$

d) $5x^2 + 16x + 3 = 0$

e) $x(x - 1) = 20$

f) $x(x + 1) = 20$

g) $a^2 - 49 = 0$

h) $25b^2 = 16$

i) $2x^2 + 3x + 1 = 0$

j) $x(x - 2) = 0$

k) $y^2 + 6y + 9 = 0$

l) $b^2 + 6b = 7$

3) The product of two consecutive numbers is 30. Find all such numbers.

4) A rectangular garden is 3 feet narrower than it is long. The garden has an area of 70 square feet. Find the dimensions of the garden.

5) The length of the hypotenuse in a right triangle is 5 inches. The shortest leg is 1 inch shorter than the length of the longest leg. Find the length of each of the legs.

Chapter 1: Factoring and Quadratic Equations

Grima, Mat 120 chapter 1 practice test

1 – 12: Completely factor the polynomial. State if a polynomial is prime.

1) $x^2 + 2x - 24$

2) $-3y^3 - 6y^2 + 9y$

3) $2n^2 + 11n + 5$

4) $16x^2 - 25$

5) $x^2 + 25$

6) $x^3 + 8$

7) $5m^2 + m - 4$

8) $3n^2 - n - 2$

9) $x^2 + 5x + 6x + 30$

10) $4x^2 - 2x - 10x + 5$

11) $x^3 - 125$

12) $x^2 + 3x + 7$

13 – 18: Solve each equation.

13) $(x + 2)(3x + 24) = 0$

14) $x^2 - 7x - 18 = 0$

15) $5x^2 - 8x + 3 = 0$

16) $x(x - 3) = 10$

17) $5x^2 + 3x - 2 = 0$

18) $2x(x + 4) = 0$

19) A rectangular garden is 2 feet narrower than it is long. The garden has an area of 35 square feet. Find the dimensions of the garden.

20) The length of the hypotenuse in a right triangle is 5 inches. The longest leg is 1 inch longer than the length of the shortest leg. Find the length of each side.

Answers:

1) $(x + 6)(x - 4)$ 2) $-3y(y+3)(y - 1)$ 3) $(2n+1)(n+5)$ 4) $(4x + 5)(4x - 5)$
5) prime   6) $(x + 2)(x^2 - 2x + 4)$ 7) $(5m - 4)(m + 1)$ 8) $(3n + 2)(n - 1)$
9) $(x+5)(x+6)$ 10) $(2x - 5)(2x - 1)$ 11) $(x - 5)(x^2 + 5x + 25)$ 12) prime
13) x = -2, -8   14) x = -2,9   15) $x = \frac{3}{5}, 1$ 16) x = -2, 5   17) $x = \frac{2}{5}, -1$
18) x = 0,-4   19) width 5 ft length 7 ft   20) short let 3 inches long leg 4 inches