Ex: (p 390)

14. $15x^2 + 11x + 2$

$30x^2$

1, 30

2, 15

3, 10

5, 6

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

$5x(3x+1) + 2(3x+1)$

$(3x+1)(5x+2)$

20. $2x^2 - 7x + 3$

6

1, 6

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

$x(2x-1) - 3(2x-1)$

$(2x-1)(x-3)$

34. $30a^2 + 38a - 20$

$2(15a^2 + 19a - 10)$

$2[15a^2 - 6a + 25a - 10]$

$2[3a(5a - 2) + 5(5a - 2)]$

$2(5a - 2)(3a + 5)$

-150

$1, 150$

$2, 75$

$3, 50$

~~$4, 7$~~

$5, 30$

$6, 25$

6.5: Factoring Binomials

EX: $(x+4)(x-4) = x^2 - 16$

$x^2 - 4x + 4x - 16$

$a^2 - b^2 = (a+b)(a-b)$

Note: $a^2 + b^2$ does not factor

$x^2 + 16$

20. $n^4 - 16 = (n^2)^2 - 4^2$

$(n^2+4)(n^2-4) = (n^2+4)(n+2)(n-2)$

38. $x^2 - 225y^2 = x^2 - (15y)^2$

$(x+15y)(x-15y)$

44. $36x^2y - 25y = y[(6x)^2 - 5^2]$

$y(6x+5)(6x-5)$

56. $100 - \frac{4}{81}n^2 = 10^2 - \left(\frac{2}{9}n\right)^2$

$\left(10 + \frac{2}{9}n\right)\left(10 - \frac{2}{9}n\right)$

$2\left(5 + \frac{1}{9}n\right)2\left(5 - \frac{1}{9}n\right)$

$4\left(5 + \frac{1}{9}n\right)\left(5 - \frac{1}{9}n\right)$

64. $100x^3y - 49xy^3 = xy\left(100x^2 - 49y^2\right)$

$xy\left(10x + 7y\right)\left(10x - 7y\right)$

70. $25y^4 - 100y^2 = 25y^2\left(y^2 - 4\right)$

$25y^2(y+2)(y-2)$

6.6: Solving Quadratic Equations by Factoring

Quadratic Equation

A quadratic equation is one that can be written in the form

$$ax^2 + bx + c = 0$$

where a, b, and c are real numbers and $a \neq 0$.

Note: If $uv = 0$, then

$u = 0$ or $v = 0$.

If $uv = 6$, then

$u = 42$ then $v = \frac{6}{42}$

$u, v \neq 0$ & same sign

Zero Factor Theorem

If a and b are real numbers and if $ab = 0$, then $a = 0$ or $b = 0$.

Ex: (p 408)

2. $(x + 4)(x - 10) = 0$

4. $(x + 11)(x + 1) = 0$

6. $x(x - 7) = 0$

2. $(x+4)(x-10) = 0$

$x+4 = 0$ $\quad$ $x - 10 = 0$

$x = -4$ $\quad$ $x = 10$

4. $(x+11)(x+1) = 0$

$x = -11, -1$

6. $x(x-7)=0$

$x=0$ $\quad$ $x-7=0$

$x=7$

$x=7,0$

20. $x^2+2x-63=0$

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

24. $x^2-3x=0$

20. $x^2+2x-63=0$

$(x-7)(x+9)=0$

$x-7=0$ $\quad$ $x+9=0$

$x=7$ $\quad$ $x=-9$

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

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

$x - 2 = 0$ $\qquad$ $x - 3 = 0$

$x = 2$ $\qquad$ $x = 3$

24. $x^2 - 3x = 0$

$x(x - 3) = 0$

$x = 0$ $\qquad$ $x - 3 = 0$

$x = 3$

28. $x^2 = 9$

30. $(x+3)(x+8) = x$

32. $x(4x - 11) = 3$

$x^2 = 9$

$x = 3, -3$

$x^2 - 9 = 0$

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

$x+3 = 0$ $\quad$ $x-3 = 0$

$x = -3$ $\quad$ $x = 3$

$(x+3)(x+8) = x$

$x^2 + 8x + 3x + 24 = x$

$x^2 + 10x + 24 = 0$

$(x+6)(x+4) = 0$

$x+6 = 0$ $\quad$ $x+4 = 0$

$x = -6$ $\quad$ $x = -4$

$$x(4x-11) = 3$$

$$4x^2 - 11x = 3$$

-12

$12, 1$

$$4x^2 - 11x - 3 = 0$$

$$4x^2 - 12x + x - 3 = 0$$

$$4x(x-3) + 1(x-3) = 0$$

$$(x-3)(4x+1) = 0$$

$x - 3 = 0$ $\qquad$ $4x + 1 = 0$

$x = 3$ $\qquad$ $4x = -1$

$x = -\frac{1}{4}$

34. $-2y^2 + 72 = 0$

36. $6x^2 + 57x = 30$

42. $4y^3 - 36y = 0$

44. $15x^3 + 24x^2 - 63x = 0$

46. $(x - 6)(x + 7) = 0$

48. $x^2 + 15x = 0$

50. $5(3 - 4x) = 9$

52. $4y^2 - 81 = 0$

60. $9x^2 + 7x = 2$

62. $3x^2 - 6x - 9 = 0$

64. $(y - 5)(y - 2) = 28$

74. $2x^2 + 12x - 1 = 4 + 3x$

76. $4x^2 - 20x = -5x^2 - 6x - 5$