Section 6.5

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

2. standard form

3. factor

4. not factored

5. 0; x

6. a) linear b) quadratic c) quadratic d) linear

11. $(x+5)(x-2)=0$ $\boxed{x \in \{-5, 2\}}$

14. $(6x+5)(x+4)=0$ $\boxed{x \in \{-\frac{5}{6}, -4\}}$

17. $t(6t+5)=0$ $\boxed{x \in \{0, -\frac{5}{6}\}}$

20. $6y(4y+9)=0$ $\boxed{x \in \{0, -\frac{9}{4}\}}$

23. $y^2+3y+2=0$

$(y+2)(y+1)=0$ $\boxed{y \in \{-2, -1\}}$

26. $r^2-4r+3=0$

$(r-3)(r-1)=0$ $\boxed{r \in \{3, 1\}}$

29. $x^2 = 3 + 2x$

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

$(x-3)(x+1) = 0$ $\quad \boxed{x \in \{3, -1\}}$

32. $p^2 - 2p = 3$

$p^2 - 2p - 3 = 0$

$(p-3)(p+1) = 0$ $\quad \boxed{p \in \{3, -1\}}$

35. $3x^2 + 5x - 2 = 0$ $\quad | \quad p = 3(-2) = -6 < \begin{matrix} +6 \\ -1 \end{matrix}$ $\quad s = 5$

$3x^2 + 6x - x - 2 = 0$

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

$(x+2)(3x-1) = 0$ $\quad \boxed{x \in \{-2, \frac{1}{3}\}}$

38. $18x^2 = 12 + 15x$

$18x^2 - 15x - 12 = 0$

$3(6x^2 - 5x - 4) = 0$ $\quad | \quad p = 6 \cdot 4 = 24 < \begin{matrix} -8 \\ +3 \end{matrix}$ $\quad s = -5$

$3(6x^2 - 8x + 3x - 4) = 0$

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

$3(2x+1)(3x-4) = 0$ $\quad \boxed{x \in \{-\frac{1}{2}, \frac{4}{3}\}}$

41 $y^2 - 9 = 0$

$(y+3)(y-3) = 0$ $\boxed{y \in \{-3, 3\}}$

44. $4w^2 - 9 = 0$

$(2w-3)(2w+3) = 0$ $\boxed{w \in \{\frac{3}{2}, -\frac{3}{2}\}}$

47 $x^2 = 7x$

$x^2 - 7x = 0$

$x(x-7) = 0$ $\boxed{x \in \{0, 7\}}$

50. $10y^2 = -5y$

$10y^2 + 5y = 0$

$5y(2y+1) = 0$ $\boxed{y \in \{0, -\frac{1}{2}\}}$

53. $3z(2z+7) = 12$

$6z^2 + 21z - 12 = 0$

$3(2z^2 + 7z - 4) = 0$

$p = -4 \cdot 2 = -8 < \begin{matrix} +8 \\ -1 \end{matrix}$

$s = 7$

$3(2z^2 + 8z - z - 4) = 0$

$3(2z(z+4) - (z+4)) = 0$

$3(2z-1)(z+4) = 0$ $\boxed{z \in \{\frac{1}{2}, -4\}}$

56. $t(3t-20) = -12$

$3t^2 - 20t + 12 = 0$

$p = 12 \cdot 3 = 36 < \begin{matrix} -18 \\ -2 \end{matrix}$

$s = -20$

$3t^2 - 18t - 2t + 12 = 0$

$3t(t-6) - 2(t-6) = 0$

$(t-6)(3t-2) = 0$ $\quad t \in \{6, \frac{2}{3}\}$

59. $(2x+7)(x^2+2x-3) = 0$

$(2x+7)(x+3)(x-1) = 0$ $\quad x \in \{-\frac{7}{2}, -3, 1\}$

62. $11r^3 - 9r = 0$

$r(11r^2 - 9) = 0$

$r(4r+3)(4r-3) = 0$ $\quad r \in \{0, -\frac{3}{4}, \frac{3}{4}\}$

65. $x^3 + y^2 - 20y = 0$

$x(x^2 + x - 20) = 0$

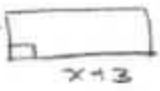
$x(x+5)(x-4) = 0$ $\quad x \in \{0, -5, 4\}$

68. $x^3 = 3x + 2x^2$

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

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

$x(x-3)(x+1) = 0$ $\quad x \in \{0, 3, -1\}$

84. Given: 

Perimeter = 34m

Find: The width

Solution: let x = the width (m)

$P = 2(l) + 2(w)$; $P = 34$, $l = x$, $w = x + 3$

$34 = 2(x) + 2(x + 3)$

$34 = 2x + 2x + 6$

$0 = 4x - 28$

$0 = 4(x - 7)$

$x = 7$

The width is 7m

85. $2(x + x + 1) = 28 + (x + 1)$

$2x + 2x + 2 = 28 + (x + 1)$

$3x - 27 = 0$

$3(x - 9) = 0$

$x \in \{9, 10\}$

86. Given : 

$A = 48\ in^2$

Find height

Solution: let x = height (in)

$A_\Delta = \frac{1}{2}bh$; $A=48, b=12, h=x$

$48 = \frac{1}{2}12x$

$48 = 6x$

$x = 8$

The height is 8 in

48 $\frac{6t^2-6t}{5t-5} = \frac{6t(t-1)}{5(t-1)} = \boxed{\frac{6t}{5}}$

51. $\frac{5k^2-13k-6}{5k+2} =$ $\quad P = -6 \quad S = -13 \quad -30 < {}^{+2}_{-15}$

$\frac{5k^2-15k+2k-6}{5k+2} = \frac{5k(k-3)+2(k-3)}{5k+2}$

$= \frac{(5k+2)(k-3)}{5k+2} = \boxed{k-3}$

54 $\frac{y^2-5y-14}{y^2+y-2} = \frac{(y-7)(y+2)}{(y+2)(y-1)}$

$\boxed{= \frac{y-7}{y-1}}$

57 $\frac{3x^3+13x^2+14x}{3x^3-5x^2-28x} = \frac{x(3x^2+13x+14)}{x(3x^2-5x-28)}$ $\quad S = 13 \quad P = 42 < {}^{+7}_{+6}$ $\quad S = -5 \quad P = 84 < {}^{+7}_{-12}$

$= \frac{3x^2+7x+6x+14}{3x^2-12x+7x-28}$

$= \frac{x(3x+7)+2(3x+7)}{3x(x-4)+7(x-4)}$

$= \frac{(x+2)(3x+7)}{(3x+7)(x-4)}$

$\boxed{= \frac{x+2}{x-4}}$.

60. $\dfrac{-20r-20r^2-5r^3}{24r^2+24r^3+6r^4} = \dfrac{-5r(r^2+4r+4)}{6r^2(r^2+4r+4)} = \boxed{\dfrac{-5}{6r}}$

68. $\dfrac{pr+qr+ps+qs}{pr+qr-ps-qs} = \dfrac{r(p+q)+s(p+q)}{r(p+q)-s(p+q)}$

$= \dfrac{(r+s)(p+q)}{(r-s)(p+q)}$ $\boxed{= \dfrac{r+s}{r-s}}$

66. $\dfrac{ac-bc-ad+bd}{ac-ad-bd+bc} = \dfrac{c(a-b)-d(a-b)}{c(a+b)-d(a+b)}$

$= \dfrac{(a-b)(c-d)}{(c-d)(a+b)}$

$\boxed{= \dfrac{a-b}{a+b}}$

69. $\dfrac{x^2y+y+x^2z+z}{xy+xz} = \dfrac{y(x^2+1)+z(x^2+1)}{x(y+z)}$

$= \dfrac{(x^2+1)(y+z)}{x(y+z)} = \boxed{\dfrac{x^2+1}{x}}$

72. $\dfrac{8+x^3}{2+x} = \dfrac{(2+x)(4+2x+x^2)}{(2+x)}$

$\boxed{= x^2+2x+4}$

75. $\dfrac{b^3-a^3}{a^2-b^2} = \dfrac{-(a^3-b^3)}{(a-b)(a+b)} = \dfrac{-(a-b)(a^2+ab-b^2)}{(a-b)(a+b)}$

$\boxed{= \dfrac{-a^2-ab+b^2}{a+b}}$