HW #10 - due Fri, 10/2
5.7 #35-75odd Solving equations by factoring

HW #11 - due Mon, 10/5
6.1 #39-79 odd Simplifying rational expressions

HW #12 - due Wed, 10/6
6.2 #3-95 odd Operations on rational expressions

6.6 #5-25 odd Literal Equations
7.1 #85-113 odd Rational Exponents and Radical Expressions

Review

Solve: $3x+36=x^2-6x$

$0=x^2-9x-36$

$0=(x+3)(x-12)$

$\boxed{x=-3,\ 12}$

34. $\dfrac{16x^2-9}{6-5x-4x^2} \div \dfrac{16x^2+24x+9}{4x^2+11x+6}$

$$= \frac{(4x)^2-3^2}{-(4x^2+5x-6)} \cdot \frac{4x^2+11x+6}{16x^2+24x+9}$$

$$= \frac{(4x-3)(4x+3)}{-(\underbrace{4x^2+8x}_{}\underbrace{-3x-6}_{})} \cdot \frac{\overbrace{4x^2+8x}^{4x(x+2)}+\overbrace{3x+6}^{+3(x+2)}}{(4x+3)(4x+3)}$$

$$-[4x(x+2)-3(x+2)]$$

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

$$= \boxed{-1}, \quad x \neq -2, -3/4, 3/4$$

36. $\dfrac{x^{4n}-1}{x^{2n}+x^n-2} \div \dfrac{x^{2n}+1}{x^{2n}+3x^n+2}$

$$= \frac{(x^{2n})^2-1^2}{(x^n)^2+x^n-2} \cdot \frac{(x^n)^2+3x^n+2}{(x^n)^2+1}$$

$$= \frac{(x^{2n}-1)(x^{2n}+1)}{(x^n+2)(x^n-1)} \cdot \frac{(x^n+2)(x^n+1)}{x^{2n}+1}$$

$$= \frac{\cancel{(x^n-1)}(x^n+1)\cancel{(x^{2n}+1)}\cancel{(x^n+2)}(x^n+1)}{\cancel{(x^n+2)}\cancel{(x^n-1)}\cancel{(x^{2n}+1)}}$$

$$= \boxed{(x^n+1)^2} = x^{2n}+2x^n+1, \quad x \neq 1$$

$x^n+2 \neq 0$
$x^n \neq -2$
$x \neq \sqrt[n]{-2}$
$x \neq \sqrt[2n]{-1}$

50. $\dfrac{2y-4}{5xy^2}+\dfrac{3-2x}{10x^2y}$

L.C.M. of $5xy^2$ & $10x^2y$ is $10x^2y^2$

$\dfrac{a}{c}\pm\dfrac{b}{c}=\dfrac{a\pm b}{c}$

$=\dfrac{(2y-4)}{5xy^2}\cdot\dfrac{2x}{2x}+\dfrac{(3-2x)}{10x^2y}\cdot\dfrac{y}{y}$

$=\dfrac{4xy-8x}{10x^2y^2}+\dfrac{3y-2xy}{10x^2y^2}=\dfrac{4xy-8x+3y-2xy}{10x^2y^2}$

$=\boxed{\dfrac{3y+2xy-8x}{10x^2y^2}}, x\neq 0, y\neq 0$

64. $\dfrac{1}{x+2}-\dfrac{3x}{x^2+4x+4}$

$=\dfrac{1}{(x+2)}\cdot\dfrac{(x+2)}{(x+2)}-\dfrac{3x}{(x+2)(x+2)}$

$=\dfrac{x+2-3x}{(x+2)(x+2)}=\dfrac{-2x+2}{(x+2)(x+2)}=\boxed{\dfrac{-2(x-1)}{(x+2)(x+2)}}$

$x\neq -2$

$=\dfrac{-2x+2}{x^2+4x+4}$

74. $\dfrac{x+1}{x^2+x-12} - \dfrac{x-3}{x^2+7x+12}$

$= \dfrac{(x+1)}{(x-3)(x+4)} \cdot \dfrac{(x+3)}{(x+3)} - \dfrac{(x-3)}{(x+3)(x+4)} \cdot \dfrac{(x-3)}{(x-3)}$

$= \dfrac{(x^2+3x+x+3) - (x^2-3x-3x+9)}{(x-3)(x+4)(x+3)}$

$= \dfrac{10x-6}{(x-3)(x+4)(x+3)} = \boxed{\dfrac{2(5x-3)}{(x-3)(x+4)(x+3)}}$, $x \neq -4, -3, 3$

80. $\dfrac{2x^2-2x}{x^2-2x-15} - \dfrac{2}{x+3} + \dfrac{x}{5-x}$

$= \dfrac{2x^2-2x}{(x-5)(x+3)} - \dfrac{2}{(x+3)} \cdot \dfrac{(x-5)}{(x-5)} + \dfrac{-x}{+1(x-5)} \cdot \dfrac{(x+3)}{(x+3)}$

$= \dfrac{2x^2-2x-2x+10-x^2-3x}{(x-5)(x+3)}$

$= \dfrac{x^2-7x+10}{(x-5)(x+3)} = \dfrac{\cancel{(x-5)}(x-2)}{\cancel{(x-5)}(x+3)} = \boxed{\dfrac{x-2}{x+3}}$, $x \neq -3, 5$

6.6 Literal Equations

6. $A = \frac{1}{2}bh$; h

$$\frac{A}{\frac{1}{2}b} = \frac{\frac{1}{2}bh}{\frac{1}{2}b}$$

$$\frac{A}{\frac{1}{2}b} = h$$

$$\boxed{\frac{2A}{b} = h}$$

10. $S = V_0 t - 16t^2$; V_0

$$\frac{S + 16t^2}{t} = \frac{V_0 t}{t}$$

$$\boxed{\frac{S + 16t^2}{t} = V_0}$$

16. $n \cdot P = \frac{R-C}{n} \cdot n$; R

$nP = R - C$

$\boxed{nP + C = R}$

20. $\underbrace{x}=\underbrace{ax}+b$; x

$x - ax = b$

$x(1-a) = b$

$\boxed{x = \frac{b}{1-a}}$

22. $y - y_1 = m \cdot (x - x_1)$; x

$$\frac{y-y_1}{m} = x - x_1$$

$$\boxed{\frac{y-y_1}{m} + x_1 = x}$$

24. $\left[\frac{1}{x} + \frac{1}{a}\right] = [b] \cdot \frac{xa}{1}$; x

$\frac{xa}{1}$

$$\frac{xa}{1}\left(\frac{1}{x} + \frac{1}{a}\right) = \frac{b}{1} \cdot \frac{xa}{1}$$

$$\frac{\cancel{x}a}{\cancel{x}} + \frac{x\cancel{a}}{\cancel{a}} = b \cdot xa$$

$$a + x = abx$$

$$a = abx - x$$

$$a = x(ab - 1)$$

$$\boxed{\frac{a}{ab-1} = x}$$

26. $a(a-x)=b(b-x)$; x

$$\underbrace{a^2-ax}=\underbrace{b^2-bx}$$

$$a^2-b^2=ax-bx$$

$$(a-b)(a+b)=x(a-b)$$

$$\frac{\cancel{(a-b)}(a+b)}{\cancel{a-b}}=x$$

$$\boxed{a+b=x}$$

34. $(\ )\cdot V=\dfrac{V_1+V_2}{\left(1+\dfrac{V_1V_2}{C^2}\right)}\cdot(\ )$; V_1

$$V\left(1+\frac{V_1V_2}{C^2}\right)=V_1+V_2$$

$$C^2\left[V+\frac{VV_1V_2}{C^2}\right]=\left[V_1+V_2\right]\cdot C^2$$

$$C^2V+\underbrace{VV_1V_2}=\underbrace{C^2V_1}+C^2V_2$$

$$VV_1V_2-C^2V_1=C^2V_2-C^2V$$

$$V_1(VV_2-C^2)=C^2V_2-C^2V$$

$$\boxed{V_1=\frac{C^2V_2-C^2V}{VV_2-C^2}}$$