

## Solving Rat'l Eqn. ws 1

1) CD:  $(x-2)(x+2)$

$$(x-4)(x+2) = (x-2)(x-2) + 1(x+2)$$

$$\cancel{x^2} - 2x - 8 = \cancel{x^2} - 3x + 6$$

$$\boxed{x = 14}$$

2) CD:  $(x-2)(x+1)$

$$4(x+1) - (x+6)(x-2) = (x-2)(x+1)$$

$$4x+4 - (x^2+4x-12) = x^2-x-2$$

$$-x^2+16 = x^2-x-2$$

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

$$\boxed{x = \frac{1 \pm \sqrt{145}}{4}}$$

6) CD:  $(x-2)(x+2)$

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

$$\cancel{x^2} - 2x - \cancel{x^2} - 4x - 4 = \cancel{x^2} + 5x + 6$$

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

$$(x+10)(x+1) = 0$$

$$\boxed{x = -10 \quad x = -1}$$

3) CD:  $2x(2x+1)$

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

$$2x^2 - 5x - 3 = 2x^2 - 4x - 2x^2 - x$$

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

$$x^2 = \frac{3}{2}$$

$$x = \pm \frac{\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\pm \frac{\sqrt{6}}{2}}$$

7) CD: 6

$$6x^2 + 17x = 3$$

$$6x^2 + 17x - 3 = 0$$

$$(6x-1)(x+3) = 0$$

$$\boxed{x = \frac{1}{6} \quad x = -3}$$

4) CD:  $(x+4)(x-4)$

$$12 - 24(x+4) = 3(x^2 - 16)$$

$$12 - 24x - 96 = 3x^2 - 48$$

$$0 = 3x^2 + 24x + 36$$

$$x^2 + 8x + 12 = 0$$

$$(x+6)(x+2) = 0$$

$$\boxed{x = -6 \quad x = -2}$$

8) CD:  $(y+2)(y-2)$

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

$$2y - 4 + y^2 + 2y = y^2 + 4$$

$$4y = 8$$

$$\cancel{x=2}$$

$$\boxed{\emptyset}$$

5) CD:  $x(x-7)$

$$6x = x - 49 + x - 7$$

$$4x = -56$$

$$\boxed{x = -14}$$

9) CD:  $x(x-4)$

$$(x+4)(x-4) + 3x = -16$$

$$x^2 - 16 + 3x = -16$$

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

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

$$\cancel{x=0}$$

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

$$\begin{aligned}
 10) \quad CD &: (y+2)(y+3) \\
 (y+3)^2 &= 2(y^2+5y+6) - 3 \\
 y^2+6y+9 &= 2y^2+10y+12-3 \\
 0 &= y^2+4y \\
 y(y+4) &= 0 \\
 \boxed{y=0 \quad y=-4}
 \end{aligned}$$

$$\begin{aligned}
 11) \quad CD &: 2(t+1)(t-1) \\
 2t + 2 \cdot 2(t-1) &= t+1 \\
 2t + 4t - 4 &= t+1 \\
 5t - 4 &= t+1 \\
 5t &= 5 \\
 \cancel{t=1} & \quad \boxed{\emptyset}
 \end{aligned}$$

$$\begin{aligned}
 12) \quad \frac{(a+2)(a+5)+2}{(a+5)} &= \frac{(a+5)(a+1)+3}{(a+1)} \\
 \frac{(a+6)(a+1)+6}{(a+1)} &= \frac{(a-1)(a+1)-3}{(a+1)} \\
 \frac{a^2+7a+12}{(a+5)} \cdot \frac{(a+1)}{a^2+7a+12} &= \frac{a^2+6a+8}{a^2-4} \quad \rightarrow \frac{(a+4)(a+2)}{(a+2)(a-2)}
 \end{aligned}$$

$$\frac{(a+1)}{(a+5)} = \frac{(a+4)}{(a-2)}$$

$$\begin{aligned}
 (a+1)(a-2) &= (a+5)(a+4) \\
 a^2 - a - 2 &= a^2 + 9a + 20 \\
 -22 &= 10a
 \end{aligned}$$

$$\boxed{\frac{-11}{5} = a}$$