

12) $(x+3)(x+5)$
 $x^2 + 5x + 3x + 15$
 $x^2 + 8x + 15$

18) $(x-5)(x-1)$
 $x^2 - 1x - 5x + 5$
 $x^2 - 6x + 5$

24) $(2x-3)(x^2+x+1)$
 $2x^3 + 2x^2 + 2x - 3x^2 - 3x - 3$
 $2x^3 - x^2 - x - 3$

30) $(x+5)^2$
 $(x+5)(x+5)$
 $x^2 + 5x + 5x + 25$
 $x^2 + 10x + 25$

36) $(x+1)^3$
 $(x+1)(x+1)(x+1)$
 $(x+1)(x^2 + 2x + 1)$
 $x^3 + 2x^2 + x + x^2 + 2x + 1$
 $x^3 + 3x^2 + 3x + 1$

42) $3 - 27x^2$
 $3(1 - 9x^2)$
 $3(1 + 3x)(1 - 3x)$

48) $3x^2 - 12x + 15$
 $3(x^2 - 4x + 5)$

54) $x^3 + 8x^2 - 20x$
 $x(x^2 + 8x - 20)$
 $x(x+10)(x-2)$

60) $8x^2 + 6x - 2$
 $2(4x^2 + 3x - 1)$
 $2(4x-1)(x+1)$
 $\boxed{4x} \quad (-1)$
 $\boxed{x} \quad (+1)$

66) $x^8 - x^5$
 $x^5(x^3 - 1)$
 $x^5(x-1)(x^2+x+1)$

72) $9y^2 + 9y - 4$
 $(3y-1)(3y+4)$
 $\boxed{3y} \quad (-1)$
 $\boxed{3y} \quad (+4)$

78) $(x-1)^2 - 2(x-1)$
 $(x-1)[(x-1) - 2]$
 $(x-1)(x-1-2)$
 $(x-1)(x-3)$

9) $\frac{x^2 + 4x - 5}{x^2 - 2x + 1}$
 $\frac{(x+5)(x-1)}{(x-1)(x-1)}$
 $\frac{x+5}{x-1}$

13) $\frac{3x+6}{5x^2} \cdot \frac{x}{x^2-4}$
 $\frac{3(x+2)}{5x^2} \cdot \frac{x}{(x+2)(x-2)}$
 $\frac{3}{5x(x-2)}$

20) $\frac{x^2+x-6}{x^2+4x-5} \cdot \frac{x^2-25}{x^2+2x-15}$
 $\frac{(x+3)(x-2)}{(x+5)(x-1)} \cdot \frac{(x+5)(x-5)}{(x+5)(x-3)}$
 $\frac{(x+3)(x-2)(x-5)}{(x+5)(x-1)(x-3)}$

$$21.) \frac{\frac{6x}{x^2-4}}{\frac{3x-9}{2x+4}} \Rightarrow \frac{6x}{(x+2)(x-2)} \div \frac{3(x-3)}{2(x+2)} \Rightarrow \frac{6x}{(x+2)(x-2)} \cdot \frac{2(x+2)}{3(x-3)} = \boxed{\frac{4x}{(x-2)(x-3)}}$$

$$24.) \frac{\frac{x-2}{4x}}{\frac{x^2-4x+4}{12x}} \Rightarrow \frac{x-2}{4x} \div \frac{(x-2)(x-2)}{12x} \Rightarrow \frac{x-2}{4x} \cdot \frac{12x}{(x-2)(x-2)} = \boxed{\frac{3}{x-2}}$$

$$33.) \frac{x^2}{2x-3} - \frac{4}{2x-3}$$

$$\frac{x^2-4}{2x-3}$$

$$\boxed{\frac{(x+2)(x-2)}{2x-3}}$$

$$43.) \frac{x}{x+1} + \frac{2x-3}{x-1}$$

$$\frac{x-1}{x-1} \cdot \frac{x}{x+1} + \frac{2x-3}{x-1} \cdot \frac{x+1}{x+1}$$

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

$$\boxed{\frac{3x^2-2x-3}{(x-1)(x+1)}} \leftarrow \text{CANNOT BE FACTORED}$$

$$45.) \frac{x-3}{x+2} - \frac{x+4}{x-2}$$

$$\frac{x-2}{x-2} \cdot \frac{x-3}{x+2} - \frac{x+4}{x-2} \cdot \frac{x+2}{x+2}$$

$$\frac{x^2-5x+6}{(x-2)(x+2)} - \frac{(x^2+6x+8)}{(x-2)(x+2)}$$

$$\frac{x^2-5x+6-x^2-6x-8}{(x-2)(x+2)}$$

$$\boxed{\frac{-11x-2}{(x-2)(x+2)}}$$

$$49.) x^2-4; x^2-x-2$$

$$(x+2)(x-2); (x-2)(x+1)$$

$$\boxed{\text{LCM: } (x+2)(x-2)(x+1)}$$

$$59.) \frac{4x}{x^2-4} - \frac{2}{x^2+x-6}$$

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

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

$$\frac{4x^2+12x-2x-4}{(x+3)(x+2)(x-2)}$$

$$\frac{4x^2+10x-4}{(x+3)(x+2)(x-2)}$$

$$\frac{2(2x^2+5x-2)}{(x+3)(x+2)(x-2)}$$

← Cannot Be Factored

$$69.) 1 + \frac{1}{x}$$

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

$$\frac{x}{x} + \frac{1}{x}$$

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

$$\frac{x+1}{x}$$

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

$$\frac{x+1}{x} \cdot \frac{x}{x-1}$$

$$\boxed{\frac{x+1}{x-1}}$$