Rat'l Expr. and Complex Fractions

1) $\frac{x^3-64}{4x^2-64} = \frac{(x-4)(x^2+4x+16)}{4(x^2-8)} = \frac{(x-4)(x^2+4x+16)}{4(x-4)(x+4)} = \boxed{\frac{x^2+4x+16}{4(x+4)}}$

2) $\frac{c(c+3)}{(5-c)(c+5)} \cdot \frac{(c+5)(c-1)}{(c+3)(c+1)} = \boxed{\frac{c(c-1)}{(5-c)(c+1)}}$

3) $\frac{(x+y)(x-y)}{x} \cdot \frac{y^3}{-y(x-y)} = \boxed{-y(x+y)}$

4) $\frac{x(x+4)}{x^2(x+10)} \cdot \frac{-(x+3)(x-3)}{(x-3)} \cdot \frac{(x+10)}{(x+4)(x+3)} = \boxed{\frac{-1}{x}}$

5) $\frac{(2x-1)}{(x-2)(x+1)} + \frac{-1}{(x-2)} \cdot \frac{(x+1)}{(x+1)} = \frac{2x-1-x-1}{CD} = \frac{(x-2)}{(x-2)(x+1)} = \boxed{\frac{1}{x+1}}$

6) $\frac{x \cdot 2x}{x(x+2)} - \frac{8}{x(x+2)} + \frac{3}{x} \cdot \frac{(x+2)}{(x+2)} = \frac{2x^2-8+3x+6}{CD} = \frac{2x^2+3x-2}{x(x+2)}$

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

7) $\frac{\frac{x+1}{x}}{\frac{x-1}{x}} = \frac{x+1}{x} \cdot \frac{x}{x-1} = \boxed{\frac{x+1}{x-1}}$

8) $\frac{\frac{2x-6}{3}}{\frac{x+12}{x}} = \frac{2(x-3)}{3} \cdot \frac{x}{(x+12)} = \boxed{\frac{2x(x-3)}{3(x+12)}}$

9) $\frac{7x^2}{(3x+5)(3x-5)} \cdot \frac{2}{2} + \frac{-2}{2(3x+5)} \cdot \frac{(3x-5)}{(3x-5)} = \frac{14x^2-6x+10}{CD}$

$= \frac{2(7x^2-3x+5)}{2(3x+5)(3x-5)} = \boxed{\frac{7x^2-3x+5}{(3x+5)(3x-5)}}$

10) $\frac{y}{y-9} - \frac{9}{y-9} = \frac{y-9}{y-9} = \boxed{1}$

11) $\frac{\frac{2y+3}{xy}}{\frac{3y-x^2}{x^2y}} = \frac{2y+3}{xy} \cdot \frac{x^2y}{3y-x^2} = \boxed{\frac{x(2y+3)}{3y-x^2}}$

12) $\frac{\frac{a^2-ab-6b^2}{ab}}{\frac{a^2+4ab+4b^2}{ab}} = \frac{a^2-ab-6b^2}{a^2+4ab+4b^2} = \frac{(a+2b)(a-3b)}{(a+2b)(a+2b)} = \boxed{\frac{a-3b}{a+2b}}$

13) $\frac{\frac{1}{x^2}-\frac{1}{y^2}}{\frac{1}{x^4}-\frac{1}{y^4}} = \frac{\frac{y^2-x^2}{x^2y^2}}{\frac{y^4-x^4}{x^4y^4}} = \frac{(y-x)(y+x)}{x^2y^2} \cdot \frac{x^4y^4}{(y^2-x^2)(y^2+x^2)} = \boxed{\frac{x^2y^2}{y^2+x^2}}$

14) $\frac{\frac{x^2-6x+5}{x^2}}{\frac{x^2-3x-10}{x^2}} \cdot \frac{x^2-6x+5}{x^2-3x-10} = \frac{(x-5)(x-1)}{(x-5)(x+2)} = \boxed{\frac{x-1}{x+2}}$

15) $\frac{\frac{2x+4(x-3)}{(x+3)(x-3)}}{\frac{2(x+3)+4x}{(x+3)(x-3)}} = \frac{6x-12}{6x+6} = \frac{6(x-2)}{6(x+1)} = \boxed{\frac{x-2}{x+1}}$

16) $\frac{\frac{2}{(x-1)}}{\frac{4x+x-1}{x(x-1)}} = \frac{2}{(x-1)} \cdot \frac{x(x-1)}{(5x-1)} = \boxed{\frac{2x}{5x-1}}$

17) $\frac{x(x^2-y^2)}{x^2(x^2+2xy+y^2)} = \frac{x(x+y)(x-y)}{x^2(x+y)(x+y)} = \boxed{\frac{x-y}{x(x+y)}}$