3. $\frac{v^2-4v-3}{7}$

$7 = 0$

none

4. $\frac{9x^3+7}{x^2+5}$

$x^2+5 = 0$

$x^2 = -5$

never

5. $\frac{y}{5y^2+22y+21}$

$5y^2+22y+21 = 0$

105

$5, 21$

$7, 15$

$5y^2+7y+15y+21 = 0$

$y(5y+7)+3(5y+7) = 0$

$(5y+7)(y+3) = 0$

$5y+7 = 0$

$5y = -7$

$y = -\frac{7}{5}$

$y+3 = 0$

$y = -3$

7. $\frac{5x-20}{7x-42} = \frac{5(x-4)}{7(x-6)}$

10. $\frac{x^3+10x^2}{x^2+2x-80} = \frac{x^2(x+10)}{(x-8)(x+10)}$

$\frac{x^2}{x-8}$

8. $\frac{9x+72}{x^2+8x} = \frac{9(x+8)}{x(x+8)} = \frac{9}{x}$

22. $\frac{u^2-v^2}{u-v} \div \frac{u}{u^2-vu}$

$\frac{(u+v)(u-v)}{u-v} \cdot \frac{u(u-v)}{u}$ $(u+v)(u-v)$

27. $$\frac{a^2+9a+20}{a^2+7a-18} \cdot \frac{a^2+5a-14}{a^2+8a+16}$$

$$\frac{(a+4)(a+5)}{(a+9)(a-2)} \cdot \frac{(a+7)(a-2)}{(a+4)(a+4)}$$

$$\frac{(a+5)(a+7)}{(a+9)(a+4)}$$

31. $$\frac{5}{7+y} + \frac{y+8}{7+y}$$

$$\frac{5+y+8}{7+y}$$

$$\frac{y+13}{y+7}$$

28. $\dfrac{5x-10}{6x^2+x} \cdot \dfrac{6x^2+13x+2}{x^2-4}$

$\dfrac{5(x-2)}{x(6x+1)} \cdot \dfrac{(6x+1)(x+2)}{(x+2)(x-2)}$

$\dfrac{5}{x}$

59. $$\frac{\frac{4}{x+2}+\frac{2(x+2)}{1(x+2)}}{\frac{14}{x+2}-\frac{2(x+2)}{1(x+2)}} \qquad \frac{\frac{4+2(x+2)}{x+2}}{\frac{14-2(x+2)}{x+2}}$$

$$\frac{4+2x+4}{x+2} \cdot \frac{x+2}{14-2x-4}$$

$$\frac{2x+8}{10-2x} \qquad \frac{2(x+4)}{2(5-x)} \qquad \frac{x+4}{5-x}$$

6. $$\frac{\frac{6}{(x-3)(x-18)}\cdot\frac{(x-18)}{(x-18)}+\frac{x}{(x-18)}\cdot\frac{(x-3)}{(x-3)}}{\frac{4}{(x-1)}\cdot\frac{(x-3)}{(x-3)}-\frac{3}{(x-3)}\cdot\frac{(x-1)}{(x-1)}}=\frac{\frac{6(x-18)+x(x-3)}{(x-3)(x-18)}}{\frac{4(x-3)-3(x-1)}{(x-1)(x-3)}}$$

$$\frac{6x-108+x^2-3x}{(x-3)(x-18)}\cdot\frac{(x-1)(x-3)}{4x-12-3x+3}$$

$$\frac{x^2+3x-108}{x-18}\cdot\frac{x-1}{x-9}$$

$$\frac{(x-9)(x+12)(x-1)}{(x-18)(x-9)}=\frac{(x+12)(x-1)}{x-18}$$

56. $$\frac{\frac{5}{1(y-3)}+\frac{5}{y-3}}{\frac{y}{1(y-3)}+\frac{2}{y-3}} = \frac{\frac{5(y-3)+5}{y-3}}{\frac{y(y-3)+2}{y-3}}$$

$$\frac{5y-15+5}{y-3} \cdot \frac{y-3}{y^2-3y+2}$$

$$\frac{5y-10}{y^2-3y+2} = \frac{5(y-2)}{(y-1)(y-2)}$$

$$\frac{5}{y-1}$$

29. $\dfrac{28n^2-343}{2n^2-17n+35} \cdot \dfrac{n^2-11n+30}{14n^2+39n-35}$

70, $10,7$

$2n^2-10n-7n+35$

$2n(n-5)-7(n-5)$

$(n-5)(2n-7)$

$\dfrac{7(4n^2-49)}{(n-5)(2n-7)} \cdot \dfrac{(n-6)(n-5)}{\quad}$

$\dfrac{7(2n+7)(2n-7)}{(n-5)(2n-7)} \cdot \dfrac{(n-6)(n-5)}{(2n+7)(7n-5)}$

$\dfrac{7(n-6)}{7n-5}$