

1.) $\frac{x+6}{9x+54}$ $x \neq -6$

Excluded $9x+54=0$
 $9x = -54$
 $x = -6$

Simplify $\frac{x+6}{9(x+6)} = \frac{1}{9}$

2.) $\frac{40a^2-64a}{80a^2}$ $a \neq 0$

Excluded $80a^2=0$
 $a^2=0$
 $a=0$

Simplify $\frac{8a(5a-8)}{80a^2} = \frac{5a-8}{10a}$

3.) $\frac{3}{2a} + \frac{3a-6}{2a^2+12a}$

$\frac{(2a^2+12a) \cdot 3 + 3a-6}{2a^2+12a}$

4.) $\left(\frac{4}{4}\right) \frac{6}{5x+6} - \frac{3x}{4} \frac{(5x+6)}{(5x+6)}$

$\frac{24-15x^2-18x}{4(5x+6)}$

$\frac{6a^2+36a+3a-6}{2a^2+12a}$

$\frac{6a^2+39a-6}{2a^2+12a}$

6.) $\frac{-x^2+11x-24}{x-8} \cdot \frac{x^2-14x+40}{10x-30}$

$\frac{-1(x^2-11x+24)}{x-8} \cdot \frac{x^2-14x+40}{10x-30}$

$\frac{-1(x-8)(x-3)}{x-8} \cdot \frac{(x-10)(x-4)}{10(x-3)}$

$= \frac{-1(x-10)(x-4)}{10}$

5.) $\frac{n^2-6n+5}{10n} \div \frac{n^2-11n+10}{10n^2-100n}$

$\frac{(n-5)(n-1)}{10n} \cdot \frac{10n(n-10)}{(n-10)(n-1)}$

$= n-5$

7.) $\frac{\frac{m}{m+4} + \frac{25}{m^2}}{\frac{m^2}{m+4}} = \frac{\frac{m^3+25(m+4)}{m^2(m+4)}}{\frac{m^2}{m+4}} = \frac{m^3+25m+100}{m^2(m+4)} \cdot \frac{m+4}{m^2}$

$= \frac{m^3+25m+100}{m^4}$

8.) $\frac{\frac{x^2}{9} + \frac{3}{x}}{\frac{x+3}{x} + \frac{x}{3}} = \frac{\frac{x^3+27}{9x}}{\frac{3x+9+x^2}{3x}} = \frac{x^3+27}{9x} \cdot \frac{3x}{x^2+3x+9}$

$= \frac{x^3+27}{3(x^2+3x+9)}$

$$9) \frac{1 \cdot r(r+4)}{r(r+4)} + \frac{6r(r+4)}{r} = \frac{2r(r+4)}{r+4}$$

Common deno.
 $r(r+4)$

$$1 + 6(r+4) = 2r$$

$$1 + 6r + 24 = 2r$$

$$25 = -4r$$

$$r = 25/-4$$

$$10.) \frac{4}{(b+3)(b+1)} = \frac{b^2 + 2b - 8}{(b+3)(b+1)}$$

Common deno.
 $b^2 + 4b + 3$

$$4 + b^2 + 4b + 3 = b^2 + 2b - 8$$

$$7 = -2b - 8$$

$$15 = -2b$$

$$-\frac{15}{2} = b$$