

1. a: $f(x) = \frac{x^2}{x}, x \neq 0$
 $g(x) = x, x \text{ is a real \#s}$ } not same function

b: $f(x) = \frac{x}{x}, x \neq 0$
 $g(x) = 1, x \text{ is a real \#s}$ } not same function

c: $f(x) = \frac{2x^2 + 6x + 8}{2} = x^2 + 3x + 4, x = \text{all real \#s}$
 $g(x) = x^2 + 6x + 8, x = \text{all real \#s}$ } not same function
but same domain

d: $f(x) = \frac{x^2 + 3x + 2}{x + 2} = \frac{(x+1)(x+2)}{(x+2)} = x+1, x \neq -2$
 $g(x) = x+1, x = \text{all real \#s}$ } not same function

e: $f(x) = \frac{x^4 - x}{x^2 + x} = \frac{x(x^3 - 1)}{x(x+1)} = \frac{x^3 - 1}{x+1}, x \neq -1$
 $g(x) = \frac{x^3 - 1}{x+1}, x \neq -1$ } not same function

f: $f(x) = \frac{x^4 + x^3 + x^2}{x^2 + x + 1} = \frac{x^2(x^2 + x + 1)}{x^2 + x + 1} = x^2, x = \text{all real \#s}$
 $g(x) = x^2, x = \text{all real \#s}$ } same function
↳ factors or zeros

2. a: $f(x) = \frac{x^4}{x^2} = x^2, x \neq 0$

b: $f(x) = \frac{3x+3}{15x-6} = \frac{3(x+1)}{3(5x-2)} = \frac{x+1}{5x-2}, x \neq \frac{2}{5}$

c: $f(x) = \frac{x^2 - x - 2}{x^2 + x} = \frac{(x-2)(x+1)}{x(x+1)} = \frac{x-2}{x}, x \neq -1$

d: $f(x) = \frac{8x^2 + 2x - 15}{4x^2 - 4x - 15} = \frac{(4x-5)(2x+3)}{(2x-5)(2x+3)} = \frac{4x-5}{2x-5}, x \neq -\frac{3}{2}$