WELCOME TO CALCULUS!

Functions

x^3+3x^2-2x

$f(x)=\dfrac{x+1}{x^2-9}$

$x \neq 3, -3$

$f(x)=\sqrt{\dfrac{x+7}{x-4}}$

$x \neq 4$

$(-\infty, 7] \cup (4, \infty)$

	Domain
Polyn	$\mathbb{R}$ $(-\infty, \infty)$
Rational	Denom $\neq 0$
odd Root	$\mathbb{R}$ $(-\infty, \infty)$
Even Root	must contain + values Testing Pts!

$f(x)=\sqrt{x+2}$ $\quad g(x)=\dfrac{2}{x-1}$

$$(f\circ g)(x)=\sqrt{\frac{2}{x-1}+2}$$

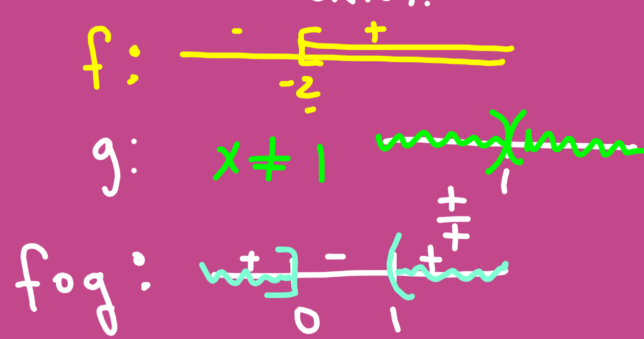
$$=\sqrt{\frac{2+2(x-1)}{x-1}}$$

$$=\sqrt{\frac{2+2x-2}{x-1}}$$

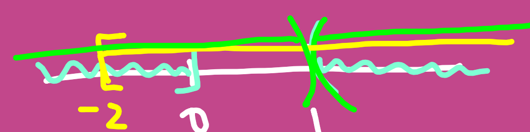
$$=\sqrt{\frac{2x}{x-1}}$$

Domain:

1) Domain of f
2) Domain of g
3) Domain of $f\circ g$
4) Where do all 3 exist?



Combine all 3 domains:



All 3 exist at:

$[-2,0] \cup (1,\infty)$

f = blue graph

g = red graph

Find $(f \circ g)(5)$

$g(5) = 1$

x y

g
When $x = 5$,
$y = 1$

$f(1) = \boxed{-1}$

x y

f
When $x = 1$
$y = -1$

Find $(g \circ f)(8)$

$f(8) = -6$

$g(-6) = \boxed{0}$