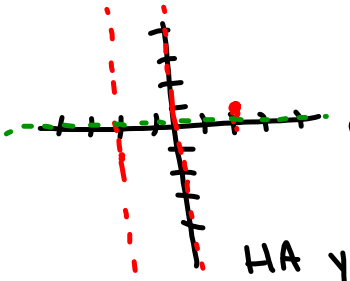
8) $f(x) = \dfrac{x-2}{x^3-4x}$

$$\frac{x-2}{x(x^2-4)} = \frac{1(x-2)}{x(x-2)(x+2)} = \frac{1}{x(x+2)}$$

$x \neq 0$	$x = 0$	V.A.	Non Removable
$x \neq 2$	$x = 2$	Hole	Removable
$x \neq -2$	$x = -2$	V.A.	Non Removable



Domain: $(-\infty,-2) \cup (-2,0) \cup (0,2) \cup (2,\infty)$

HA $y = 0$

Hole $x = 2$

$f(2) = \dfrac{1}{x(x+2)} = \dfrac{1}{8}$

Range: $(-\infty,0) \cup \left(0,\frac{1}{8}\right) \cup \left(\frac{1}{8},\infty\right)$

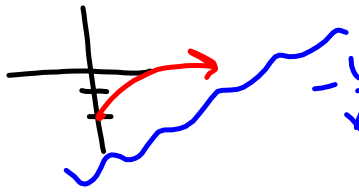
7) $f(x)=\frac{x-4}{\sqrt{x}+2}$

$\sqrt{x}+2 \stackrel{?}{=} 0$

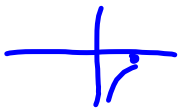
$\sqrt{x}=-2$

$x \geq 0$

Continuous



$-\frac{(x-1)}{x^2+2x-3}=\frac{-(x-1)}{(x+3)(x-1)}=\frac{-1}{x+3}$



10) Domain:

$(-\infty,-3)\cup(-3,1)\cup(1,\infty)$

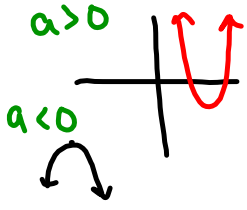
Range:

Need $f(1)=-\frac{1}{4}$ $(-\infty,-\frac{1}{4})\cup(-\frac{1}{4},0)\cup(0,\infty)$

12) $f(x)=1x^2-8x+14$

$a>0$

$a<0$



Continuous

Domain: $(-\infty,\infty)$

Range: $[-2,\infty)$

vertex $\left(\frac{-b}{2a}, f(x)\right)$

$\frac{-(-8)}{2(1)}$

$(4, -2)$