6. $y = \dfrac{x-1}{x^2-7x+12}$

Domain

$x^2-7x+12=0$

PSD $(x-3)(x-4)=0$

$x-3=0 \quad x-4=0$

$x \neq 3 \quad x \neq 4$

x-int

$0 = \dfrac{x-1}{x^2-7x+12}$

$0 = x-1$

$x=1$

y-int

$y = \dfrac{0-1}{0^2-7(0)+12}$

$y = -\dfrac{1}{12}$

VA $y = \dfrac{x-1}{(x-3)(x-4)}$

$(x-3)(x-4)=0$

$x-3=0 \quad x-4=0$

$x=3 \quad x=4$

HA $y=0$

SA NONE

$y = \dfrac{x-1}{x^2-7x+12}$ $\quad P \quad P'=1$ $\quad Q \quad Q'=2x-7$

$\dfrac{P'Q-PQ'}{Q^2}$

$y' = \dfrac{1(x^2-7x+12)-(x-1)(2x-7)}{(x^2-7x+12)^2}$

$= \dfrac{(x^2-7x+12)-(2x^2-9x+7)}{(x^2-7x+12)^2}$

$= \dfrac{x^2-7x+12-2x^2+9x-7}{(x^2-7x+12)^2}$

$= \dfrac{-x^2+2x+5}{(x^2-7x+12)^2}$

$0 = (x^2-7x+12)^2 \quad 0 = -x^2+2x+5$

$0 = x^2-7x+12 \quad a=-1 \; b=2 \; c=5$

$x=3 \quad x=4 \quad x = \dfrac{-2 \pm \sqrt{2^2-4(-1)(5)}}{2(-1)}$

$= \dfrac{-2 \pm \sqrt{4+20}}{-2}$

$= \dfrac{-2 \pm \sqrt{24}}{-2}$

$= \dfrac{-2 \pm 2\sqrt{6}}{-2}$

$= 1 \pm \sqrt{6}$