Algebra & Trig - MATH 1450-02 - Quiz #6 - Jan 30, 2013

Name:

1. Find the domain:

$$f(x) = \frac{\sqrt{4-x}}{x^2-5x+6}$$

① $4 - x \geq 0$

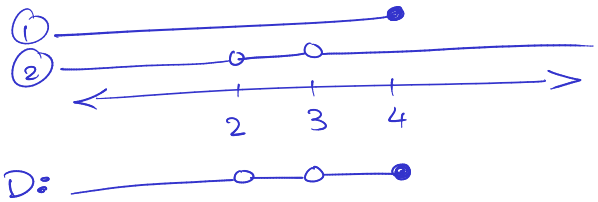
$\Rightarrow x \leq 4$

② $x^2 - 5x + 6 \neq 0$

$x^2 - 5x + 6 = 0$

$(x-3)(x-2) = 0$

exclude: $\begin{cases} x = 3 \\ x = 2 \end{cases}$



$\Rightarrow D_f = (-\infty, 2) \cup (2, 3) \cup (3, 4]$

2. Evaluate the difference quotient for the following function, and then simplify it

$$f(x) = \frac{1}{x}$$

Recall that the difference quotient is $\frac{f(x+h)-f(x)}{h}$.

$$\frac{f(x+h)-f(x)}{h} = \frac{\frac{1}{x+h} - \frac{1}{x}}{h} = \frac{\frac{x-(x+h)}{x(x+h)}}{h} = \frac{x-x-h}{x(x+h)} \cdot \frac{1}{h}$$

Common denominator

multiply by reciprocal of denominator

$$= \frac{-h}{hx(x+h)} = \frac{-1}{x(x+h)}$$