

In class work 1 has questions 1 through 3 with a total of 15 points. Digitize your work and submit it to Canvas. This assignment is due *Wednesday 24 at 13:15 P.M.*

- 5 1. Find the *natural domain* of the function F whose formula is $F(x) = \frac{1}{5 + \frac{1}{x}}$

Solution: There are two denominators; we need to require that both are nonzero; thus in implicit form, the domain is

$$\text{dom}(F) = \left\{ x \mid (x \neq 0) \wedge \left(5 + \frac{1}{x} \neq 0 \right) \right\}$$

Solving each inequation for x gives an explicit form; it is

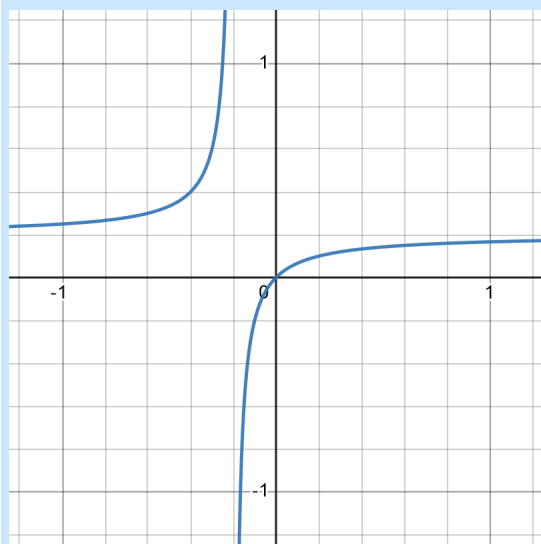
$$\text{dom}(F) = \left\{ x \mid (x \neq 0) \wedge \left(x \neq -\frac{1}{5} \right) \right\}$$

In interval notation, this is

$$\text{dom}(F) = (-\infty, -\frac{1}{5}) \cup (-\frac{1}{5}, 0) \cup (0, \infty).$$

- 5 2. Use desmos to graph $y = \frac{1}{5 + \frac{1}{x}}$. As best you can, reproduce the graph here. Also, use the graph to determine $\text{range}(F)$. Be careful! Is one in the range?

Solution:



- 5 3. Define functions $F(x) = \frac{1}{x-1}$ and $G(x) = \sqrt{x-1}$. Fill in the chart:

| Function | Formula | domain |
|---------------|---------|--------|
| $F + G$ | | |
| $\frac{F}{G}$ | | |
| $F \circ G$ | | |
| $G \circ F$ | | |

Show all of your work below: (You might like to use Desmos to help.)