

MATH 118: Quiz 4

Name: key

Directions:

- * Show your thought process (commonly called "showing your work") when solving each problem for full credit.
- * If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- * Good luck!

1. Find the domain of the following functions:

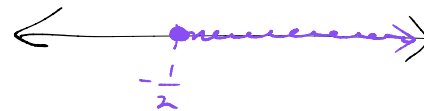
(a) $f(x) = \sqrt{2x+1}$

① Problems

① a) no division, N/A

① b) Solve $2x+1 < 0$
 $2x < -1$
 $x < -\frac{1}{2}$

② Remove problems:



Domain: $[-\frac{1}{2}, \infty)$

(b) $g(x) = \frac{3x^2}{3x^2 - 7x - 10}$

① Problems

① a) Solve $3x^2 - 7x - 10 = 0$

$(3x-10)(x+1) = 0$

$3x-10 = 0$ $x+1 = 0$

$x = \frac{10}{3}$ $x = -1$

$\frac{3}{1} \frac{-10}{1} \checkmark$

① b) no root, N/A

② Remove problems



Domain: $(-\infty, -1) \cup (-1, \frac{10}{3}) \cup (\frac{10}{3}, \infty)$

2. For an arbitrary function $f(x)$ (not from the previous problem) what is expression for the average rate of change on $(x, x+h)$?

$\uparrow$ $\uparrow$
 a b

$$\frac{f(b) - f(a)}{b - a} = \frac{f(x+h) - f(x)}{x+h - x} = \boxed{\frac{f(x+h) - f(x)}{h}}$$

3. Consider the function

$$f(x) = \begin{cases} x - 1 & x < 1 \\ 2x - 2 & x \geq 1 \end{cases}$$

Choose your tick marks and sketch a graph of $f(x)$.

