

MTH 138 Quiz #4

Name \_\_\_\_\_ Row \_\_\_\_\_

**Show Essential work. Note that these sample questions are presented primarily for the purpose of helping you solidify the acquired concepts on related topics. The questions on the actual quiz may differ in type and format.**

(1) Solve for  $x$ :  $(2x - 10)(5 + x)^2(4 - x) < 0$

(2) Find an equation for line passing through the point  $(3, 5)$  and parallel to the line  $2x - 3y = 10$ .

(3) Find the  $x$ -intercept and  $y$ -intercept of the line  $2x - 5y = 10$ .

(4) Given the function  $f(x) = x^2 - x$  and nonzero real numbers  $a$  and  $h$ , simplify

(i)  $f(\sqrt{a})$

(ii)  $f\left(\frac{-1}{a}\right)$

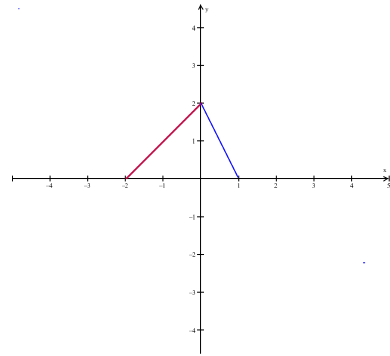
(iii)  $\frac{f(a+h) - f(a)}{h}$

(5) Find the domain of the function  $f(x) = \frac{\sqrt{2x-1}}{x-3}$ .

(6) Sketch the graph of  $f(x) = 2\llbracket x \rrbracket$ .

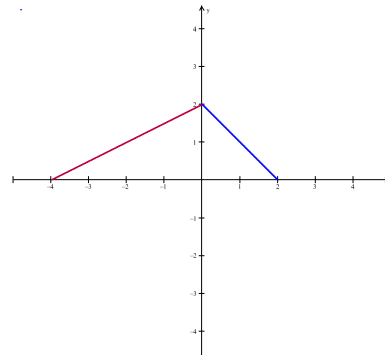
(7) How can we obtain the graph of  $g(x) = -\frac{1}{x-2} + 3$  from the graph of  $f(x) = \frac{1}{x}$ ?

(8) If the graph of  $f(x)$  is



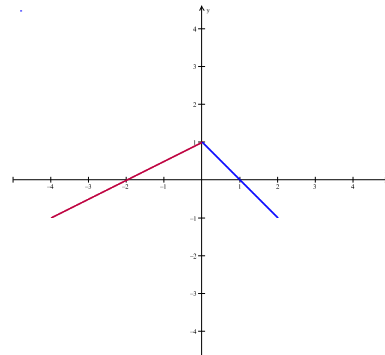
with domain  $[-2, 1]$

(i) then the graph of  $g(x) = f(??)$  would look like



What is the domain of this new function  $g(x)$ ?

(ii) then the graph of  $h(x) = f(??)$  would be



What is the domain of this new function  $h(x)$ ?

Answers.

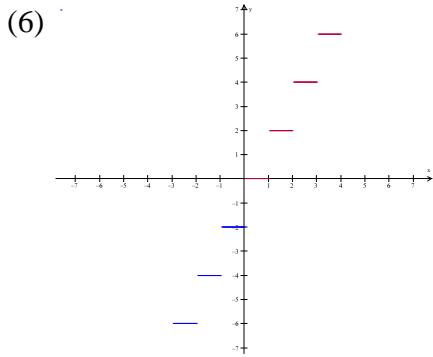
(1)  $x < -5$  or  $-5 < x < 4$  or  $5 < x \Leftrightarrow (-\infty, -5) \cup (-5, 4) \cup (5, \infty)$

(2)  $2x - 3y = -9$

(3)  $x$ -intercept = 5;  $y$ -intercept = -2

(4) (i)  $a - \sqrt{a}$ ; (ii)  $\frac{1}{a^2} + \frac{1}{a}$ ; (iii)  $2a + h - 1$

(5)  $x \geq \frac{1}{2}$  but  $x \neq 3 \Leftrightarrow \left[ \frac{1}{2}, 3 \right) \cup 3, \infty$



(7) Shift to the right by two units, reflect with respect to  $x$ -axis, and move up by 3 units.

(8) (i)  $g(x) = f\left(\frac{1}{2}x\right)$ ; domain =  $[-4, 2]$  (ii)  $h(x) = f\left(\frac{1}{2}x\right) - 1$ ; domain =  $[-4, 2]$