

Math 176  
Quiz 1  
Professor Busken

Name: \_\_\_\_\_

Directions: You may not use a calculator. The use of any other electronic devices are strictly prohibited. Show your work on ALL of the questions. Working together is on this quiz is prohibited. In addition to completing these six problems, please staple and attach the your solution to the linear problem I gave you on day one of the class. This quiz is due this Thursday at 5:30pm, no exceptions, no lates accepted.

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1. (5 points) Find the equation of the line that goes through  $(-2, -11)$  and is perpendicular to the line passing through  $(1, 1)$  and  $(5, -1)$ .

1. \_\_\_\_\_

2. (5 points) Suppose  $f(x) = \begin{cases} 3x & \text{if } x < 0 \\ x + 1 & \text{if } 0 \leq x \leq 2 \\ (x - 2)^2 & \text{if } x > 2 \end{cases}$ . Evaluate the piecewise defined function at the values indicated below.

(a)  $f(-5)$  (a) \_\_\_\_\_

(b)  $f(0)$  (b) \_\_\_\_\_

(c)  $f(1)$  (c) \_\_\_\_\_

(d)  $f(2)$  (d) \_\_\_\_\_

(e)  $f(5)$  (e) \_\_\_\_\_

3. (6 points) Suppose  $g(x)$  is the function defined by  $g(x) = \frac{2x}{x-1}$

Evaluate the difference quotient  $\frac{g(a+h) - g(a)}{h}$ , where  $h \neq 0$ . Your answer should be a single rational expression (fraction).

3. \_\_\_\_\_

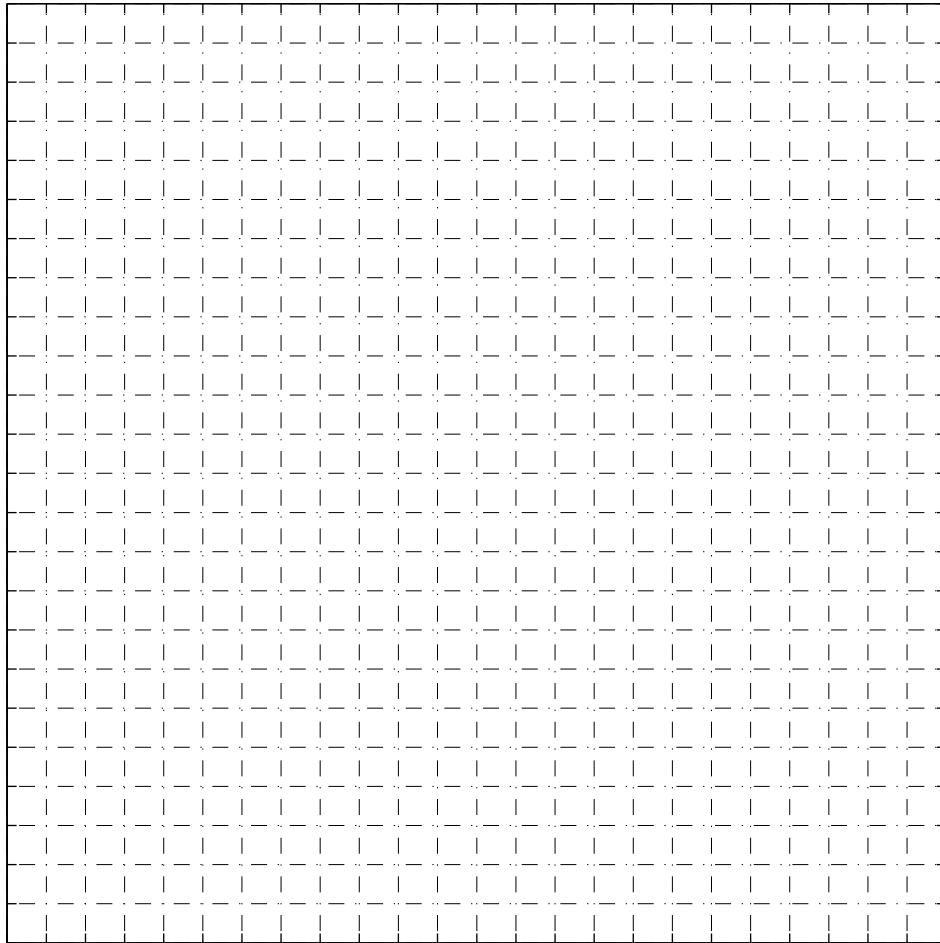
4. (5 points) Find the domain of  $f(x) = \sqrt[5]{x-5}$ . Express the domain set using interval notation.

4. \_\_\_\_\_

5. (5 points) Find the domain of  $f(x) = \frac{4}{\sqrt{x-5}}$ . Express the domain set using interval notation.

5. \_\_\_\_\_

6. (5 points) Sketch the graph of  $f(x) = \begin{cases} -x & \text{if } x < 0 \\ \sqrt{9 - x^2} & \text{if } 0 \leq x \leq 3 \\ (x - 2)^2 & \text{if } x > 3 \end{cases}$ .



7. (5 points) ***Linear problem from day 1.*** Find the area of the triangle formed by the coordinate axes and the line  $2y + 3x - 6 = 0$ . Afterwards, find the equation of the line that is perpendicular ( $\perp$ ) to  $2y + 3x - 6 = 0$  that goes through the origin. Where do the lines intersect?