Lab Quiz 1.1 20 minutes

Name: Student ID:

Always justify your answers!

Q1]... [2 points]
What is the domain of the function $f(x) = \sqrt{3x-5}$?

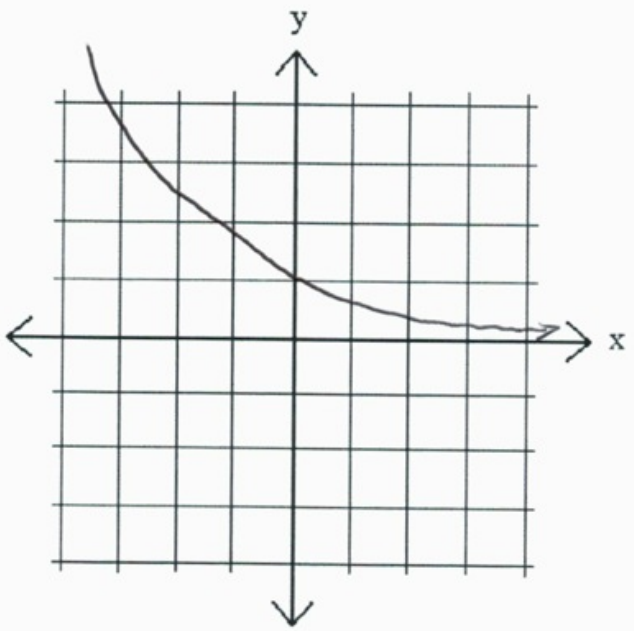
1pt for the inequality $\longrightarrow 3x - 5 \geq 0$

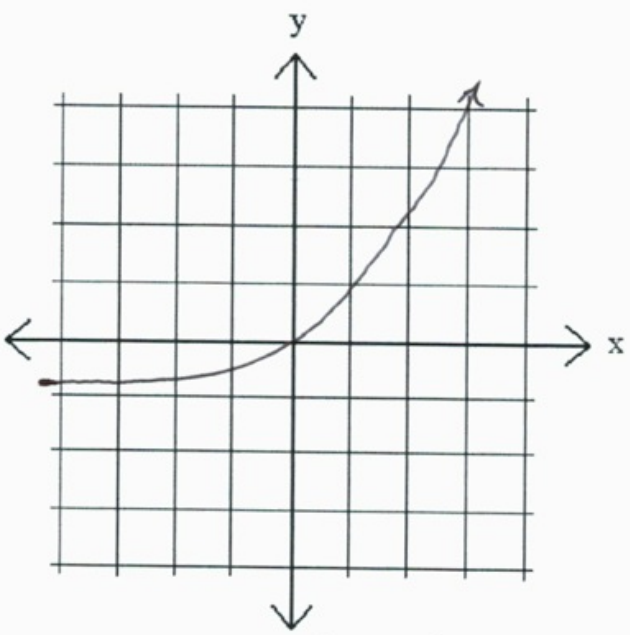
$3x \geq 5$

$x \geq \frac{5}{3}$

1 pt for rearranging the inequality and stating answer. $\left\{ \text{or } x \text{ in } [5/3, \infty) \right.$

Q2]... [4 points] Roughly sketch the graph of each of these functions, clearly indicating any places where the function crosses the y axis: (a) $f(x) = e^{-x}$, (b) $g(x) = 2^x - 1$.





Each graph is 2pts, 1 pt for correct y-intercept and 1pt for correct limits as $x \longrightarrow \pm\infty$.

Q3]. . . [4 points] Decide whether or not the limit exists. If it exists, what is it?

(a) $\lim_{x\to 3} \dfrac{x+1}{x-3}$

$$\lim_{x\to 3^-} \frac{x+1}{x-3} = \frac{\text{positive}}{\text{negative}} = -\infty \quad \Big] \text{ 1 pt}$$

$$\lim_{x\to 3^+} \frac{x+1}{x-3} = \frac{\text{positive}}{\text{positive}} = +\infty \quad \Big] \text{ 1 pt}$$

Since left and right limits are different, the limit does not exist.

(b) $\lim_{x\to -3} \dfrac{x^2+x-6}{x+3}$

$x^2 + x - 6 = (x+3)(x-2)$] 1 pt for factoring

$$\text{so } \lim_{x\to -3} \frac{(x+3)(x-2)}{(x+3)} = \lim_{x\to -3} x-2 = -3-2 = -5$$

1pt for canceling and taking limits.