MTH 261, Quiz #1, Spring 2019 Name KEY

Instructions: You must show all work to receive full credit for the problems below. You may check your work with a calculator, but answers without work will receive minimal credit. Use exact answers unless the problem starts with decimals or you are specifically asked to round.

1. For the function $f(x,y) = 3^x + 7xy$, find $f(0,-2), f(-2,1), f(2,1)$.

$f(0,-2) = 3^0 + 7(0)(-2) = 1$

$f(-2,1) = 3^{-2} + 7(-2)(1) = \frac{1}{9} - 14 = \frac{-125}{9}$

$f(2,1) = 3^2 + 7(2)(1) = 9 + 14 = 23$

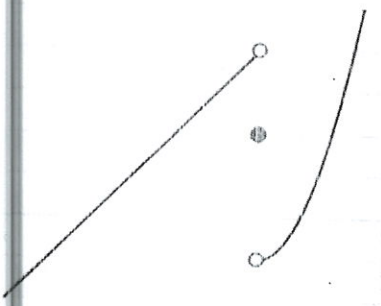
2. State the domain and range of the function $f(x,y) = \sqrt{y - 3x}$. Write your domain in set notation, and the range in interval notation.

$y - 3x \geq 0 \Rightarrow y \geq 3x$

D: $\{(x,y) \mid y \geq 3x\}$

R: $[0, \infty)$

3. Find the following limits using the graph.



a. $\lim_{x \to 1^-} F(x)$ 4

b. $\lim_{x \to 1^+} F(x)$ −1

c. $\lim_{x \to 1} F(x)$ DNE

d. $F(1)$ 2

4. Use numerical methods to find the value of $\lim_{x \to 0} \frac{e^x - 1}{x^2 - 2x}$.

x	1	0.1	.01	.001	.0001	-.0001	-.001	-.01	-.1	-1
F(x)	-1.718	-.5535	-.5005	-.5005	-.5001	-.5000	-.4995	-.495	-.4532	-.2107

$= -1/2$