Quiz3, MAT 1375 Professor Chiu

ID:_____ Name: Sol.

- This quiz consists of 2 questions, each worth 5 points, for a total of 10 points.
- You have 10 minutes to complete the quiz.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

$(x+h)^2 = (x+h)(x+h)$

$= x^2+xh+hx+h^2$

1. Given a function $f(x) = x^2 + 2x - 3$. Find $\frac{f(x+h)-f(x)}{h}$.

$f(x+h) = (x+h)^2+2(x+h) - 3$

$= x^2+2xh+h^2 +2x+2h-3$

$f(x+h)-f(x) = (x^2+2xh+h^2+2x+2h-3) - (x^2+2x-3)$

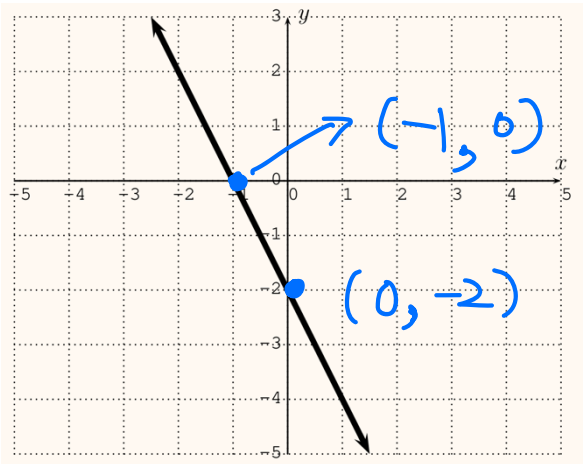
$= x^2+2xh+h^2+2x+2h-3 -x^2-2x+3$

$= 2xh+h^2+2h$

$\Rightarrow \frac{f(x+h)-f(x)}{h} = \frac{2xh+h^2+2h}{h} = \frac{h(2x+h+2)}{h} = 2x+h+2$

2. Find (a) the slope and (b) y-intercept of the line with the given graph. Then (c) use the slope and y-intercept, write the equation of the line in slope-intercept form.

From graph, we know $(-1,0)$ and $(0,-2)$ is on the graph



Then, Let $(x_1, y_1) = (-1, 0)$

$(x_2, y_2) = (0, -2)$

(a)

We have slope $= \frac{y_2-y_1}{x_2-x_1} = \frac{-2-0}{0-(-1)} = \frac{-2}{1} = -2$

(b) y- intercept is the intersection point of the graph and y-axis $\Rightarrow$ $\boxed{(0, -2)}$

(c) Line equation is

$$y = \underline{\text{slope}} \cdot x + c$$

by (a) $\Rightarrow$ $y = -2x + c$

by (b) $\Rightarrow$ $\boxed{y = -2x - 2}$

(since this line passes $(0, -2)$
we can plug $(0, -2)$ into $y = -2x + c$
and get $-2 = -2 \cdot (0) + c \Rightarrow c = -2$)