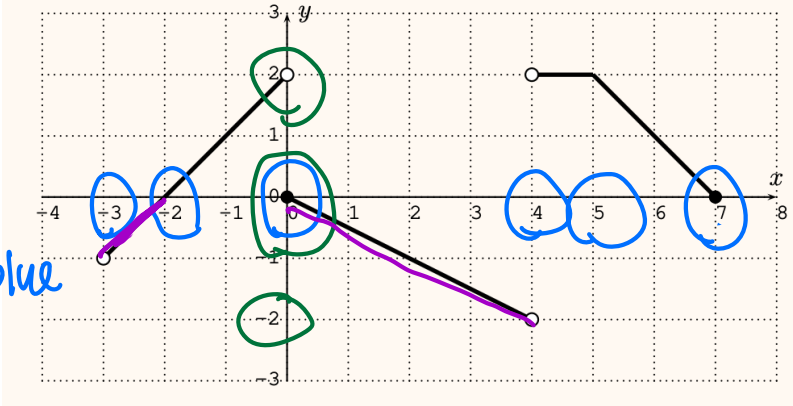
MAT 1375, Classwork3, Fall2024

ID:_____ Name:_____

1. Let f be the function given by the following graph.
   (a) What is the domain of f?
   (b) What is the range of f?
   (c) For which x is $f(x) < 0$?
   (d) Find $f(0) + 5$.
   (e) Find $f(0 + 5)$.

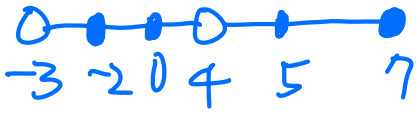


(a) ① special points circled in blue

$x = -3, -2, 0, 4, 5, 7$

↑ smallest x ↑ largest x

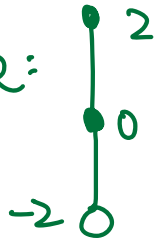
② excluding the x which has no output: $x = -3$, $x = 4$

③ Domain  $\Rightarrow$ $x \in (-3, 4) \cup (4, 7]$

(b) ① special points circled in green: $y = -2$, $y = 0$, $y = 2$

② excluding the y which has no input: $y = -2$

(here $y = 2$ has no input at $x = 4$ but it has input in $(4, 5]$)

③ Range:  $\Rightarrow$ $y \in (-2, 2]$

(c) For which x is $f(x) < 0$ $\Rightarrow$ find x whose output $y < 0$

$-3 < x \leq -2$ or $0 \leq x < 4$ $\Rightarrow$ $x \in (-3, 2] \cup [0, 4)$

(d) $f(0) = 0$. $f(0) + 5 = 0 + 5 = 5$

(e) $f(0+5) = f(5) = 2$

2. Given a function $f(x) = x^4 + 2x^3 - 3x^2 - 4x + 3$ by the following graph.
   Find all intercepts and all extrema.

X- intercepts : △

Y- intercepts : □

local maximum: ☆

local minimum: ●