Michael Chillemi quiz 2

1. State intervals on the graph

[-4, -2)

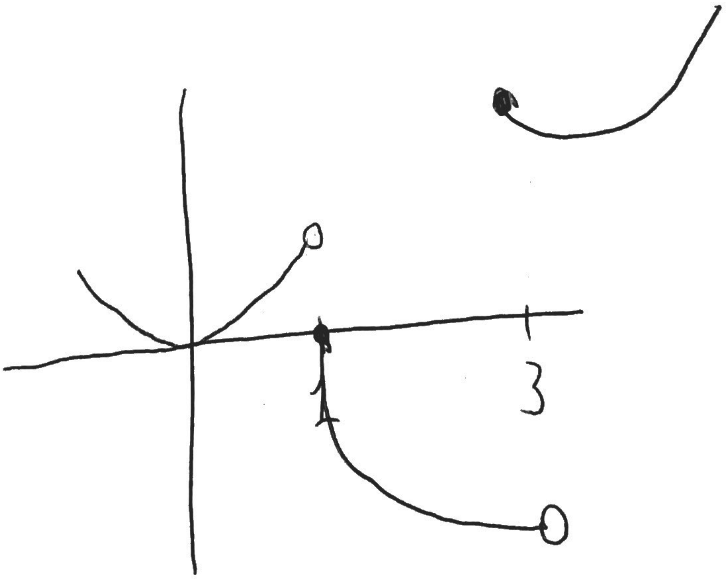
(-2, -2)

[2, 4)

(4, 6)

(6, 8

2.



3. $f(x) = \begin{cases} e^x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$ $a = 0$

$f(0) = 0$

$\lim\limits_{x \to 0^-} f(x) = \lim\limits_{x \to 0^-} e^x$

$= e^0$

$= 1$

$\lim\limits_{x \to 0^+} f(x) = \lim\limits_{x \to 0^+} x^2 = 0$

$\lim\limits_{x \to 0^-} f(x) \neq \lim\limits_{x \to 0^+} f(x)$

$\lim\limits_{x \to 0}$ does not exist

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4. $f(x) = \begin{cases} x+3 & \text{if } x < 0 \\ e^x & \text{if } 0 \leq x \leq 1 \\ 7 - x & \text{if } x > 1 \end{cases}$

$\lim\limits_{x \to 0^-} x + 3 = 3$

$\lim\limits_{x \to 0^+} e^x = 1$

$\lim\limits_{x \to 0^-} \neq \lim\limits_{x \to 0^+}$ function discontinuous at Point $x = 0$

$\lim\limits_{x \to 1^-} e^x = e$

$\lim\limits_{x \to 1^+} 7 - x = 6$

$\lim\limits_{x \to 1^-} \neq \lim\limits_{x \to 1^+}$ function discontinuous at Point $x = 1$

5. $f(x) = \begin{cases} \dfrac{x^2-4}{x-2} & \text{if } x < 2 \\ ax^2-bx+3 & \text{if } 2 \le x < 3 \\ 4x-a+b & \text{if } x \ge 3 \end{cases}$

$\lim_{x \to 2^-} \left(\dfrac{x^2-4}{x-2} \right)$ $(x+2)\ (x+2)$

$\lim_{x \to 2^-} x+2$

$\dfrac{\lim(2^-) = \lim(2^+)}{4}$

$x=2$

$2+2=4$

$a^2 - bx + 3$

$4a - 2b + 3 = 4$

$4a - 2b - 1 = 0$

$4a - 2b = 1$

3 from the ler

$ax^2 - bx + 3 \quad x=3$

$a9 - b3 + 3 = 0$

$9a - 3b + 3 = 0$

$4x - a + b =$

$4(3) - a + b = 0$

$12 - a + b$

$9a - 3b + 3 = \cancel{12} - \cancel{a} + b$

$9a - 3b + 3 = 12 - 9 + b$

$10a - 4b = 9$

$a = 7/2 \quad b = \dfrac{13}{2}$

6.

a) $\lim_{x \to \infty} g(x) = 2$

H.A. $y = 2$

$y = -2$

b) $\lim_{x \to -\infty} g(x) = -2$

V.A. $x = 0$

$x = -2$

$x = 3$

c) $\lim_{x \to 3} g(x) = \infty$

d) $\lim_{x \to 0} g(x) = -\infty$

e) $\lim_{x \to -2^+} g(x) = -\infty$

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7. find graph that satisfies all given conditions

8. $f(x) = \frac{8}{x^3 - 1}$

$\lim_{x \to 1^-} \left(\frac{8}{x^3 - 1} \right)$, $x < 1$

plug. in any value less than 1 it is $-\infty$

denominator will be negative

$\lim_{x \to 1^+} \left(\frac{8}{x^3 - 1} \right)$ $x > 1$

Plug in any value greater than 1

it is ∞

denominator will be positive