

Sec 2.4 day 1 page 121 (1-13, 15, 16)

①  $\lim_{x \rightarrow a} f(x) = f(a)$

② The graph has no hole, jump, or vertical asymptote.

③ a)  $x = -4$  not defined

$x = -2, 2,$  and  $4$  because left and right limits are not the same.

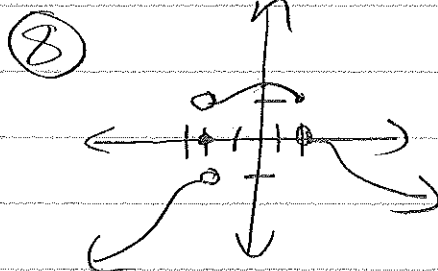
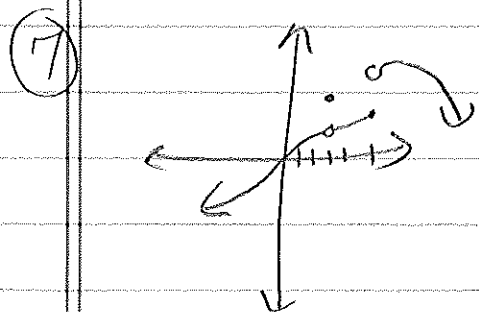
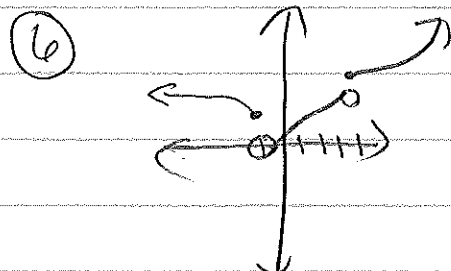
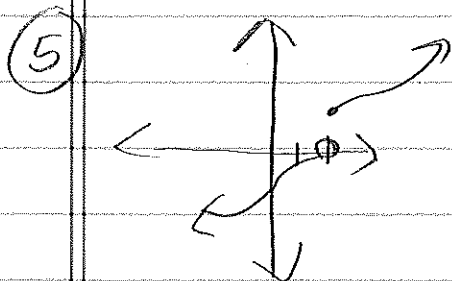
b)  $-4$  not continuous from either side as  $f(4)$  is not defined.

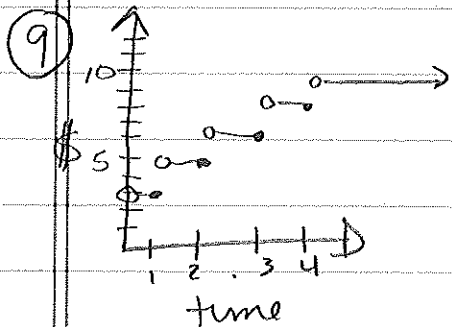
$-2$  continuous from the left

$2$  continuous from the right

$4$  continuous from the right

④  $[-4, 2), (-2, 2), [2, 4), (4, 6), (6, 8)$





b) discon at 1, 2, 3, 4

- 10
- a) continuous
  - b) continuous
  - c) discontinuous
  - d) discontinuous
  - e) up for debate depending on your definition of current  
I think discontinuous.

11

$$2(5) - g(5) = 4$$

$$-g(5) = -6$$

$$g(5) = 6$$

12

$$\lim_{t \rightarrow 1} \frac{2t - 3t^2}{1 + t^3} = \frac{2 - 3}{1 + 1} = \frac{-1}{2}$$

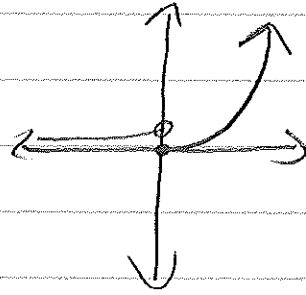
$h(1) = \frac{-1}{2}$   $\therefore h(t)$  is continuous at  $a = 1$ .

13

$$\lim_{t \rightarrow -1} (x + 2x^3)^4 = (-1 + 2)^4 = (-3)^4 = 81$$

$f(-1) = 81$   $\therefore f(x)$  is continuous at  $a = -1$

$$(15) f(x) = \begin{cases} e^x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$



discontinuity at 0

because  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$

$$(16) f(x) = \begin{cases} \frac{x^2 - x}{x^2 - 1} & \text{if } x \neq 1 \\ 1 & \text{if } x = 1 \end{cases}$$

$$\frac{x(x-1)}{(x-1)(x+1)} = \frac{x}{x+1}$$

$\lim_{x \rightarrow 1} \frac{x}{x+1} = \frac{1}{2}$  not 1 so discontinuity at  $x=1$

graph is

