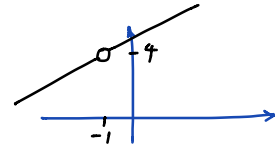
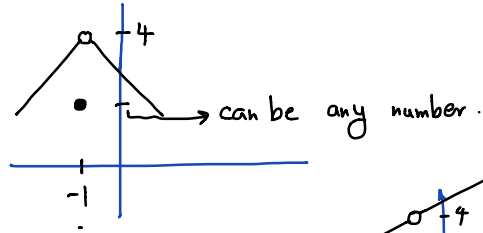
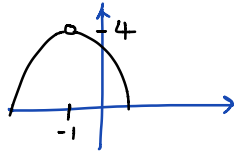
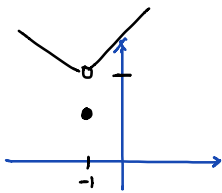


(1) (a) False. Counter-ex:



There should be a "hole" at $x = -1$, you can have a closed dot at (-1)
 Or the function can be UNDEFINED at $x = -1$. (NO unique answer)
NOT at 4

(b) piece-wise function \rightarrow 'border' point \rightarrow left & right lim

False

$$g(x) = \begin{cases} \frac{x^2 - 6x + 8}{x - 4} & x < 4 \\ \sqrt{x} & x \geq 4 \end{cases}$$

$$\rightarrow \lim_{x \rightarrow 4^-} g(x) = \lim_{x \rightarrow 4^-} \frac{x^2 - 6x + 8}{x - 4} \stackrel{\text{sub}}{=} \frac{4^2 - 6 \cdot 4 + 8}{4 - 4} = \frac{0}{0} \rightarrow \text{Factorize}$$

$$\lim_{x \rightarrow 4^-} g(x) = \lim_{x \rightarrow 4^-} \frac{(x-4)(x-2)}{x-4} = 4 - 2 = 2$$

$$\Rightarrow \lim_{x \rightarrow 4} g(x) = 2$$

$$\rightarrow \lim_{x \rightarrow 4^+} g(x) = \lim_{x \rightarrow 4^+} \sqrt{x} = \sqrt{4} = 2 \quad \text{Does Exist.}$$

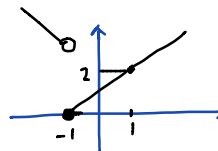
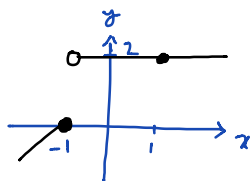
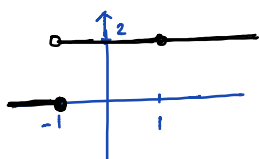
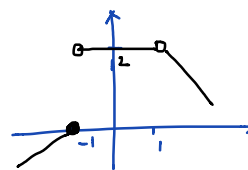
2) a) $\lim_{x \rightarrow -1} \frac{|x-3|}{\sqrt{x+5}} \stackrel{\text{sub}}{=} \frac{|-1-3|}{\sqrt{-1+5}} = \frac{4}{\sqrt{4}} = \frac{4}{2} = 2$

b) $\lim_{x \rightarrow -4^+} \frac{1 - \frac{1}{x}}{x+4} \stackrel{\text{sub}}{=} \frac{1 - \frac{1}{-4}}{-4^+ + 4} = \frac{\frac{5}{4}^+}{\frac{0^+}{\text{number}}} = +\infty$

3) • $f(-1) = 0 \rightarrow$ closed dot at $(-1, 0)$

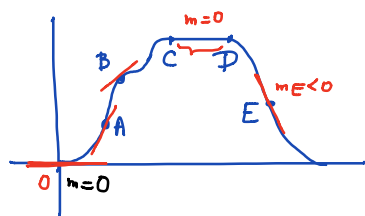
• $\lim_{x \rightarrow -1} f(x)$ DNE \rightarrow Jump

• $\lim_{x \rightarrow 1} f(x) = 2$



Any graph that satisfies the three conditions is OK.

(3) Velocity (instantaneous) = slope of tangent line



a) initial $v = 0$

b) between C and D

c) E \rightarrow negative velocity

"
negative slope

"
opposite direction

"
coming back

(d) at B : $m_B < m_A$