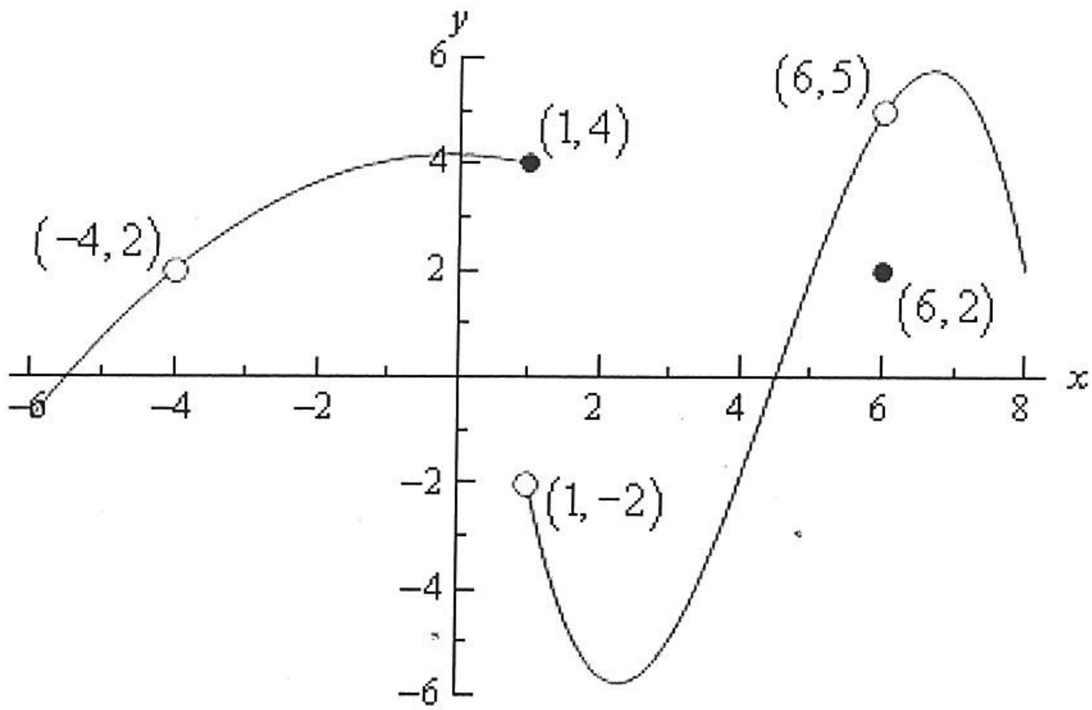
Given the following graph,



compute each of the following.

(a) $f(-4)$ (b) $\lim_{x \to -4^-} f(x)$ (c) $\lim_{x \to -4^+} f(x)$ (d) $\lim_{x \to -4} f(x)$

(e) $f(1)$ (f) $\lim_{x \to 1^-} f(x)$ (g) $\lim_{x \to 1^+} f(x)$ (h) $\lim_{x \to 1} f(x)$

(i) $f(6)$ (j) $\lim_{x \to 6^-} f(x)$ (k) $\lim_{x \to 6^+} f(x)$ (l) $\lim_{x \to 6} f(x)$

Name:______________________________________ Date:________

AP Calculus Ms. Loughran

THEOREM. *Let* lim *stand for one of the limits* $\lim_{x \to a}$, $\lim_{x \to a^-}$, $\lim_{x \to a^+}$, $\lim_{x \to +\infty}$, *or* $\lim_{x \to -\infty}$. *If* $L_1 = \lim f(x)$ *and* $L_2 = \lim g(x)$ *both exist, then*

(*a*) $\lim [f(x) + g(x)] = \lim f(x) + \lim g(x) = L_1 + L_2$

(*b*) $\lim [f(x) - g(x)] = \lim f(x) - \lim g(x) = L_1 - L_2$

(*c*) $\lim [f(x)g(x)] = \lim f(x) \lim g(x) = L_1 L_2$

(*d*) $\lim \frac{f(x)}{g(x)} = \frac{\lim f(x)}{\lim g(x)} = \frac{L_1}{L_2}$ *if* $L_2 \neq 0$

(*e*) $\lim \sqrt[n]{f(x)} = \sqrt[n]{\lim f(x)} = \sqrt[n]{L_1}$ *provided* $L_1 \geq 0$ *if n is even.*

In words, this theorem states:

(*a*) *The limit of a sum is the sum of the limits.*

(*b*) *The limit of a difference is the difference of the limits.*

(*c*) *The limit of a product is the product of the limits.*

(*d*) *The limit of a quotient is the quotient of the limits provided the limit of the denominator is not zero.*

(*e*) *The limit of an nth root is the nth root of the limits.*