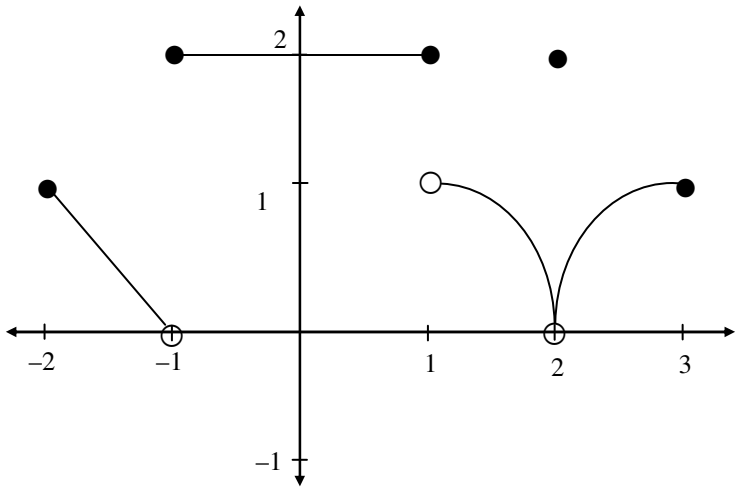
Calculus Review Worksheet

(1) Find each of the following given the graph of $y = f(x)$ below.



(a) $\lim_{x \to -2} (f(x))$ **(d)** $\lim_{x \to -1} (f(x))$ **(g)** $\lim_{x \to 1^-} (f(x))$

(b) $\lim_{x \to -1^-} (f(x))$ **(e)** $\lim_{x \to 2^-} (f(x))$ **(h)** $\lim_{x \to 1^+} (f(x))$

(c) $\lim_{x \to -1^+} (f(x))$ **(f)** $\lim_{x \to 2^+} (f(x))$ **(i)** $\lim_{x \to 3} (f(x))$

(j) Is f continuous at x = 0? , x = 1? , x = 2?

(2) Is the function $y = f(x)$ defined below continuous at $x = \pi$?

$$f(x) = \begin{cases} \dfrac{\sin(3x)}{x - \pi} & \text{if } x \neq \pi \\ 3 & \text{if } x = \pi \end{cases}$$

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(3) Evaluate each of the following limits please.

(a) $\lim_{x \to 4} \left(\dfrac{x^3 - 64}{x^3 - 2x^2 - 7x - 4} \right)$

(b) $\lim_{x \to \infty} \left(\dfrac{x^3 - 64}{x^3 - 2x^2 - 7x - 4} \right)$

(c) $\lim_{x \to -1} \left(\dfrac{x^3 - 64}{x^3 - 2x^2 - 7x - 4} \right)$

(d) $\lim_{x \to 2} \left(\dfrac{\sqrt{12x + 1} - 5}{7x^2 - 13x - 2} \right)$

(e) $\lim_{x \to 2} \left(\dfrac{\sqrt[3]{7x^2 - 1} - 3}{x^4 - 16} \right)$

(f) $\lim_{x \to 2^-} \left(\dfrac{|x - 2|}{x - 2} \right)$

(g) $\lim_{x \to 5^-} \left(\left[2x \right] - \left[x^2 \right] \right)$

(h) $\lim_{x \to -3^-} \left(\dfrac{|2x^2 + 7x + 3|}{5x^2 + 19x + 12} \right)$

(i) $\lim_{x \to \infty} \left(\dfrac{3^{x+1} + 3^{x-1}}{3^{x+2} - 12} \right)$

(j) $\lim_{x \to \infty} \left(\sqrt[3]{8x^3 + 5x^2 - x} - 2x \right)$

(k) $\lim_{x \to \infty} \left(\dfrac{\sin(5x)}{7x} \right)$

(l) $\lim_{x \to 0} \left(\dfrac{\sin^3(5x)}{7x^3} \right)$

(m) $\lim_{x \to 0} \left(\dfrac{5x^3 - 7x^2}{\sin^2(3x)} \right)$

(n) $\lim_{x \to \frac{\pi}{3}} \left(\dfrac{\cos(3x) + 1}{(3x - \pi)^2} \right)$

(o) $\lim_{x \to \frac{\pi}{3}} \left(\dfrac{1 + 2\cos(2x)}{\pi - 3x} \right)$

(p) $\lim_{x \to 0} \left(\dfrac{\sin(x) - \tan(x)}{x^3} \right)$

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Answers

(1) **(a)** No Limit **(d)** No Limit **(g)** 2

(b) 0 **(e)** 0 **(h)** 1

(c) 2 **(f)** 0 **(i)** No Limit

(j) Yes , No , No

(2) No, $\lim_{x \to \pi} (f(x)) = -3$

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Answers

(3)

(a) $\frac{48}{25}$

(b) 1

(c) ∞

(d) $\frac{2}{25}$

(e) $\frac{7}{216}$

(f) -1

(g) -15

(h) $\frac{5}{11}$

(i) $\frac{10}{27}$

(j) $\frac{5}{12}$

(k) 0

(l) $\frac{125}{7}$

(m) $-\frac{7}{9}$

(n) $\frac{1}{2}$

(o) $\frac{2\sqrt{3}}{3}$

(p) $-\frac{1}{2}$