Question answer 1

a) $\lim_{x \to 10} f(x)$ = 0

b) $\lim_{x \to 6^-} f(x)$ = 2

c) $\lim_{x \to 6^+} f(x)$ = 5

d) $\lim_{x \to 6} f(x)$ = Not defined

e) $\lim_{x \to -8} f(x)$ = -6

f) $f(-8)$ =-3

Question answer 2

a) $\lim_{x \to 1} \frac{\sqrt{x+15}-4}{x-1}$

$$\lim_{x \to 1} \frac{\sqrt{1+15}-4}{1-1} = \frac{0}{0}$$

$$\lim_{x \to 1} \frac{\sqrt{x+15}-4}{x-1} \times \frac{\sqrt{x+15}+4}{\sqrt{x+15}+4} = \lim_{x \to 1} \frac{1}{\sqrt{x+15}+4}$$

$$\lim_{x \to 1} \frac{1}{4+4} = \frac{1}{8}$$

b) $\lim_{x \to 9} \frac{\sqrt{x}-3}{x-9}$

$$\lim_{x \to 9} \frac{\sqrt{9}-3}{9-9} = \frac{3-3}{9-9} = \frac{0}{0}$$

$$\lim_{x \to 9} \frac{\sqrt{x}-3}{x-9} \times \frac{\sqrt{x}+3}{\sqrt{x}+3}$$

$$\lim_{x \to 9} \frac{1}{\sqrt{x}+3} = \frac{1}{\sqrt{9}+3} = \frac{1}{6}$$

Question answer 3

a) $\lim_{x \to 0} \frac{sin^2(2x)}{2x^2}$

$$\lim_{x \to 0} \frac{sin(4x)^2}{2x^2} \qquad \lim_{x \to 0} \frac{2\sin(4*2)}{4*2}$$

$$\lim_{x \to 0} 2 * 1 = 2$$

b) $\lim_{x \to 0} \frac{x}{\frac{1}{x+7} - \frac{1}{7}}$

$$\lim_{x \to 0} \frac{x}{\frac{x}{7*(x+7)}} = 7*(x+7) = 7*(0+7) = 49$$

$$\lim_{x \to 0} = 49$$

Question answer 4

a) $$\lim_{x\to\infty} \frac{6x-4x^2+2x-7}{2x^3-16}$$

$$\lim_{x\to\infty} \frac{x^3(6-\frac{4}{x}+\frac{2}{x^2}-\frac{7}{x^3})}{x^3(2-\frac{16}{x^3})} = \frac{6}{2} = 3$$

b) $$\lim_{x\to\infty} \frac{x^2-9}{(2x+1)^2}$$

$$\lim_{x\to\infty} \frac{x^2-9}{2x^2+2x+1}$$

$$\lim_{x\to\infty} \frac{x^2(1-\frac{9}{x^2})}{x^2(4+\frac{4}{x}+\frac{1}{x^2})} = \frac{1}{4}$$

Question answer 5

a) $$\lim_{x\to-2^+} 3^x = 3^{-2} = \frac{1}{3^2} = \frac{1}{9}$$

$$\lim_{x\to-2^-} = \frac{1}{(x)^2+5} = \frac{1}{(-2)^2+5} = \frac{1}{9}$$

$$\lim_{x\to-2^+} f(x) = \lim_{x\to-2^-} f(x)$$

Functions connect x = -2

b) $\lim\limits_{x \to 1^{+}} = \cos(3\pi x) = \cos(3\pi * 1) = -1$

$\lim\limits_{x \to 1^{-}} 3^{x} = 3^{1} = 3$

$$\lim_{x \to 1^{\mp}} f(x) \neq \lim_{x \to 1^{-}} f(x)$$

Functions not connect $\quad$ x = -1

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