1. Evaluate the following limits:

a) $\lim\limits_{x\to 2} \dfrac{x^2-4}{x^2+x-6}$

b) $\lim\limits_{x\to 0} \dfrac{\sqrt{x+2}-\sqrt{2}}{x}$

c) $\lim\limits_{x\to 1} \dfrac{x^3-1}{x-1}$

2. Evaluate the following limits:

a) $\lim\limits_{x\to \infty} \dfrac{\sqrt{x}-3}{x-9}$

b) $\lim\limits_{x\to \infty} \sqrt{\dfrac{3+9x}{1000+x}}$

3. Find the following limits, if they exist

a) $\lim\limits_{x\to 1^-} \dfrac{x^2+x-2}{|x-1|}$

b) $\lim\limits_{x\to 2} \dfrac{x^2-x-2}{|x-2|}$

4. A function f is defined as

$$f(x) = \begin{cases} \dfrac{x^2-1}{1-x} & , \ x > 1 \\ -2 & , \ x \le 1 \end{cases}$$

Determine the continuity of f at $x = 1$.

5. Function f defines as

$$f(x) = \begin{cases} 3x+1 & , \ -1 \le x < 2 \\ kx^2 & , \ x \ge 2 \end{cases}$$

Find the constant k so that f is continuous at $x = 2$

ANSWER :

1 a) $\dfrac{4}{5}$ b) $\dfrac{1}{2\sqrt{2}}$ c) 3

2 a) 0 b) 3

3a) -3 b) does not exist

4) f is continuous at $x = 1$

5) $k = \dfrac{7}{4}$