Computation of limits worksheet

1. $\lim_{x\to -5} \frac{x^2-25}{x^2+2x-15}$

$$\lim_{x\to -5} \frac{(x\ \ +\ \ )(x\ \ -\ \ )}{(x\ \ +\ \ )(x\ \ -\ \ )}$$

$$\lim_{x\to -5} \frac{(x\ \ -\ \ )}{(x\ \ -\ \ )}$$

$$\frac{(-5\ -\ \ )}{(-5\ -\ \ )}$$

$$\frac{(\ \ )}{(\ \ )}$$

$$\frac{}{}$$

2. $\lim_{x\to 4} \frac{\sqrt{x}-2}{x-4}$

$$\lim_{x\to 4} \frac{\sqrt{x}\ -\ 2}{x\ -\ 4} \cdot \frac{\sqrt{x}\ \ \ 2}{\sqrt{x}\ \ \ 2}$$

$$\lim_{x\to 4} \frac{(\ \ -\ \ )}{(x\ \ -\ \ 4)(\sqrt{x}\ \ +\ \ 2)}$$

$$\lim_{x\to 4} \frac{1}{(\sqrt{x}\ +\quad)}$$

$$\frac{1}{(\sqrt{4}+\quad)}$$

$$\frac{}{}$$

3. $\lim_{x\to -3} \frac{6+4x}{x^2+1}$

$$\lim_{x\to -3} \frac{6+4(\quad)}{(\quad)^2+1}$$

$$\frac{6\quad+}{\quad+\quad 1}$$

$$\frac{}{}$$

4. $\lim_{x\to 0} \frac{(6+x)^2-36}{x}$

$$\lim_{x\to 0} \frac{(36\ +\quad +x^2)\ -\ 36}{x}$$

$$\lim_{x\to 0}\frac{x^2 + \quad x}{x}$$

$$\lim_{x\to 0}\frac{x(\quad + \quad)}{x}$$

$$\lim_{x\to 0}(\quad + \quad)$$

$$\lim_{x\to 0}(0 + \quad)$$

5. $\lim_{x\to 4}\frac{x^2-16}{x-4}$

$$\lim_{x\to 4}\frac{(x - \quad)(x + \quad)}{(x-4)}$$

$$\lim_{x\to 4}(x + \quad)$$

$$\lim_{x\to 4}(4 + \quad)$$

6. Bonus Question:

$$\lim_{x \to 0} \frac{1}{x\sqrt{x+1}} - \frac{1}{x} \quad = \quad \text{——}$$