Ex 2 :

1. $\lim\limits_{x \to +\infty} \left(x^2 + \frac{2}{x}\right) = +\infty + 0 = +\infty$

$\lim\limits_{x \to +\infty} \left(2x + \ln x\right) = +\infty + \infty = +\infty$

2. $\lim\limits_{x \to +\infty} \left(2x + e^x\right) = +\infty + \infty = +\infty$

$\lim\limits_{\substack{x \to 0 \\ x > 0}} \frac{e^x}{x} = \frac{e^0}{0} = \frac{1}{0} = +\infty$

3. $\lim\limits_{x \to +\infty} \frac{1}{e^x + 1} = \frac{1}{+\infty} = 0$

$\lim\limits_{x \to +\infty} 3e^{-2x} = 3 \times e^{-\infty} = 3 \times 0 = 0$

4. $\lim\limits_{x \to 1} x^2 e^x = 1^2 \times e^1 = e$

$\lim\limits_{x \to 1} 2x^3 \ln x = 2 \times 1^3 \times \ln 1 = 0$

5. $\lim\limits_{x \to +\infty} \ln(x-2) = \ln(+\infty) = +\infty$

$\lim\limits_{\substack{x \to 2 \\ x > 2}} \ln(x-2) = \ln(0) = -\infty$

6. $\lim\limits_{x \to +\infty} 2e^{x+1} = 2 \times e^{+\infty} = 2 \times (+\infty) = +\infty$

$\lim\limits_{x \to -\infty} e^{1-x} = e^{1-(-\infty)} = e^{1+\infty} = e^{+\infty} = +\infty$

7. $\lim\limits_{x \to +\infty} x^2 \ln x = +\infty \times (+\infty) = +\infty$

$\lim\limits_{x \to -\infty} (x+1) e^{-x} = (-\infty) \times e^{-(-\infty)} =$

$= -\infty \times e^{+\infty} = -\infty \times (+\infty) = -\infty$

8. $\lim\limits_{x \to 0} (e^x + e^{-x}) = e^0 + e^0 = 2$

$\lim\limits_{x \to -\infty} e^{1/x} = e^{\frac{1}{-\infty}} = e^0 = 1$

9. $\lim\limits_{x \to +\infty} \left(2x + \frac{\ln x}{x}\right) = +\infty + 0 = +\infty$

$\lim\limits_{x \to +\infty} \left(1 + \frac{e^x}{x^2}\right) = 1 + \infty = +\infty$