

$$1. \lim_{x \rightarrow 3} (-x^2 + 5x - 1) = -(3^2) + 5(3) - 1 = -9 + 15 - 1 = \boxed{5}$$

$$2. \lim_{x \rightarrow 3} (x^2 + 2) = 3^2 + 2 = \boxed{11}$$

$$3. \lim_{x \rightarrow 100} 7x = 7(100) = \boxed{700}$$

$$4. \lim_{x \rightarrow 5} \frac{x+2}{x-4} = \frac{5+2}{5-4} = \frac{7}{1} = \boxed{7}$$

$$5. \lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = \frac{2^2 - 4}{2 - 2} = \frac{0}{0} \text{ indeterminate}$$

$$\hookrightarrow \lim_{x \rightarrow 2} \frac{(x-2)(x+2)}{x-2} = \lim_{x \rightarrow 2} (x+2) = 2+2 = \boxed{4}$$

$$6. \lim_{x \rightarrow 1} \frac{x^2 - x}{2x^2 + 5x - 7} = \frac{1^2 - 1}{2(1^2) + 5(1) - 7} = \frac{0}{0} \text{ indeterminate}$$

$$\hookrightarrow \lim_{x \rightarrow 1} \frac{x(x-1)}{(2x+7)(x-1)} = \lim_{x \rightarrow 1} \frac{x}{2x+7} = \frac{1}{2(1)+7} = \boxed{\frac{1}{9}}$$

$$7. \lim_{x \rightarrow -1} \frac{x^3 + 1}{x^2 + 5x + 4} = \frac{(-1)^3 + 1}{(-1)^2 + 5(-1) + 4} = \frac{0}{0} \text{ indeterminate}$$

$$\hookrightarrow \lim_{x \rightarrow -1} \frac{(x+1)(x^2 - x + 1)}{(x+1)(x+4)} = \lim_{x \rightarrow -1} \frac{x^2 - x + 1}{x+4} = \frac{(-1)^2 - (-1) + 1}{-1 + 4}$$

$$= \frac{1+1+1}{3} = \frac{3}{3} = \boxed{1}$$

$$8. \lim_{a \rightarrow 7} \frac{a^2 - 49}{7 - a} = \frac{7^2 - 49}{7 - 7} = \frac{0}{0} \text{ indeterminate}$$

$$\hookrightarrow \lim_{a \rightarrow 7} \frac{(a+7)(a-7)}{-(a-7)} = \lim_{a \rightarrow 7} \frac{a+7}{-1} = \frac{7+7}{-1} = \boxed{-14}$$

$$9. \lim_{x \rightarrow -2} \frac{x^2 + 5x + 6}{x^2 - 4} = \frac{(-2)^2 + 5(-2) + 6}{(-2)^2 - 4} = \frac{4 - 10 + 6}{4 - 4} = \frac{0}{0} \text{ indeterminate}$$

$$\hookrightarrow \lim_{x \rightarrow -2} \frac{(x+2)(x+3)}{(x+2)(x-2)} = \lim_{x \rightarrow -2} \frac{x+3}{x-2} = \frac{-2+3}{-2-2} = \frac{1}{-4} = \boxed{-\frac{1}{4}}$$

$$10. \lim_{x \rightarrow 5} \frac{x^2 - 7x + 10}{x + 5} = \frac{5^2 - 7(5) + 10}{5 + 5} = \frac{0}{10} = \boxed{0}$$