① ⓐ $\lim\limits_{x \to 1} \frac{\downarrow x^2 - 1}{\uparrow x^2 + 1} = \boxed{0}$ ⓑ $\lim\limits_{x \to 1} \frac{x-1}{x^2-1} = \lim\limits_{x \to 1} \frac{1}{x+1} = \boxed{\frac{1}{2}}$

ⓒ $\lim\limits_{x \to +\infty} \frac{x^3 + x + 1}{3x^3 - x - 1} = \boxed{\frac{1}{3}}$

ⓓ $\lim\limits_{x \to -\infty} \frac{x^3 + x + 1}{3x^3 - x - 1} = \boxed{\frac{1}{3}}$

ⓔ $\lim\limits_{x \to +\infty} \frac{x^3 + x + 1}{3x^2 - x - 1} = \lim\limits_{x \to +\infty} \frac{x + \frac{1}{x^2} + \frac{1}{x^2}}{3 - \frac{1}{x} - \frac{1}{x^2}} = \boxed{+\infty}$

ⓕ $\lim\limits_{x \to -\infty} \frac{x^3 + x + 1}{3x^2 - x - 1} = \boxed{-\infty}$

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② ⓐ $\lim\limits_{x \to 1} \sqrt{f(x)} = \sqrt{\lim\limits_{x \to 1} f(x)} = \sqrt{4} = \boxed{2}$

ⓑ $\lim\limits_{x \to 1} \frac{1}{g(f(x))} = \lim\limits_{y \to 4} \frac{1}{g(y)} = \boxed{0}$

ⓒ $\lim\limits_{x \to 4} h(g(x)) = \lim\limits_{y \to \infty} h(y) = \boxed{10}$

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③ ⓐ $\lim\limits_{x \to 0} \frac{\sin(2x)}{\sin(3x)} = \lim\limits_{x \to 0} \left\{ \frac{2x \frac{\sin(2x)}{2x}}{3x \frac{\sin(3x)}{3x}} \right\} = \frac{2}{3} \cdot \frac{1}{1} = \boxed{\frac{2}{3}}$
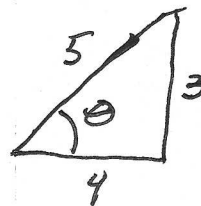
ⓑ $\lim\limits_{x \to \pi/2} \tan(x)$ does not exist,

ⓒ $\lim\limits_{x \to \pi/2} \tan^2(x) = +\infty$

ⓓ $\lim\limits_{x \to \infty} \tan^{-1}(x) = \pi/2$

ⓔ $\lim\limits_{x \to -\infty} \tan^{-1}(x) = -\pi/2$

④ $\cos\left(\sin^{-1}\left(\frac{3}{5}\right)\right) = \boxed{\frac{4}{5}}$.

⑤ ⓐ $\ln(e^2) = 2\ln(e) = \boxed{2}$

ⓑ $e^{\ln(3^2+3+1)} = 3^2+3+1 = 9+3+1 = \boxed{13}$

ⓒ $\ln\sqrt{e^{3/5}} = \ln\left((e^{3/5})^{1/2}\right) = \ln\left(e^{\frac{3}{10}}\right) = \boxed{\frac{3}{10}}$