

1) $\lim_{x \rightarrow -1} (3x^3 - x + 2) = 3*(-1)^3 - (-1) + 2 = 3*-1 + 1 + 2 = -3 + 1 + 2 = 0$
 A 0 B 3 C does not exist D -2

2) $\lim_{x \rightarrow 1} \frac{x^2 - 5x + 4}{x - 2} = \frac{1 - 5 + 4}{-1} = \frac{-4 + 4}{-1} = \frac{0}{-1} = 0$
 A -1 B does not exist C ∞ D 0

3) $\lim_{x \rightarrow 3} \frac{x - 2}{x^2 - 5} = \frac{3 - 2}{9 - 5} = \frac{1}{4}$
 A ∞ B does not exist C $\frac{1}{4}$ D -2

4) $\lim_{x \rightarrow 5} \frac{x - 5}{x^2 - 25} = \frac{(x-5) \cdot 1}{(x-5)(x+5)} = \frac{1}{x+5} = \frac{1}{10}$
 A 10 B $\frac{1}{10}$ C does not exist D 0

5) $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2} = \frac{(x-2)(x^2 + 2x + 4)}{(x-2)} = x^2 + 2x + 4 = 4 + 4 + 4 = 12$
 A 12 B $\frac{1}{12}$ C does not exist D 0

6) $\lim_{x \rightarrow 1} \sqrt[3]{x^2 - 9} = \sqrt[3]{1 - 9} = \sqrt[3]{-8} = -2$
 A ± 2 B 2 C does not exist D -2

7) $\lim_{x \rightarrow 0} \frac{(\sqrt{x+2} - \sqrt{2})}{x} = \frac{(\sqrt{x+2} + \sqrt{2})}{(\sqrt{x+2} + \sqrt{2})} = \frac{x+2 + 2\sqrt{2x+4} - 2}{x+2+2\sqrt{2x+4}-2} = \frac{x}{x\sqrt{x+2} + \sqrt{2}} = \frac{1}{\sqrt{2} + \sqrt{2}} = \frac{1}{2\sqrt{2}}$
 A $2\sqrt{2}$ B $\frac{1}{\sqrt{2}}$ C $\frac{1}{2\sqrt{2}}$ D does not exist

8) $\lim_{x \rightarrow 0} \frac{x^2 - 5x}{x} = \frac{x^2 + 5x}{x^2 + 5x} = \frac{x^4 + 5x^3 - 5x^3 - 5x^2}{x^3 + 5x^2} = \frac{x^4 - 5x^2}{x^3 + 5x^2} = -5$
 A ∞ B 0 C does not exist D -5

9) $\lim_{x \rightarrow \frac{\pi}{4}} \sin(x) = \sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$
 A $\frac{\sqrt{2}}{2}$ B 0 C does not exist D $\frac{1}{2}$

10) $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x - 3} = \frac{(x-3)(x+2)}{(x-3)}$
 A ∞ B 1 C does not exist D 5

11) If $f(x) = \begin{cases} 2\cos x - 2; & x \geq 0 \\ x & ; x < 0 \end{cases}$, then $\lim_{x \rightarrow 0} f(x) =$
 A 0 B 2 C does not exist D -2

12) $\lim_{x \rightarrow -3^+} \frac{x^3 + 3}{x^3 + 27} = \frac{-27 + 3}{-27 + 27} = \frac{-24}{0} = -\infty$
 A $\frac{1}{27}$ B 27 C does not exist D $\frac{1}{9}$

13) The function $f(x) = \frac{x-5}{x^2-5x+6}$ is discontinuous at $(x-3)(x-2)$
 A -3, -2 B 2, 3 C -1, 6 D -6, 1

14) $\lim_{x \rightarrow 3^+} \frac{-2}{x-3} = -\infty$
 A ∞ B $\pm\infty$ C $-\infty$ D 0

15) $\lim_{x \rightarrow \infty} \frac{6x^3 - x}{-2x^3 - 3} = \frac{6}{-2} = -3$
 A ∞ B 0 C 3 D -3

16) If $y = -2x^3 - 5x + 4$, then $y' = -6x^2 - 5$
 A $6x^2 - 5$ B $-6x^2 - 5$ C $-6x^2 + 5$ D $-2x^2 + 3x - 5$

17) If $y = \frac{2}{x^5}$, then $y' = 2x^{-5} = -10x^{-6} = -\frac{10}{x^6}$
 A $-\frac{10}{x^4}$ B $-\frac{10}{x^6}$ C $\frac{5}{x^6}$ D $\frac{10}{x^6}$

18) If $y = \frac{x-1}{x+1}$, then $y' = \frac{(1)(x+1) - (1)(x-1)}{(x+1)^2} = \frac{x+1 - x+1}{(x+1)^2} = \frac{2}{(x+1)^2}$
 A $2(x+1)^{-2}$ B $2(x+1)^2$ C $(x+1)^{-2}$ D $-2(x+1)^{-2}$

19) If $f(x) = \frac{x-1}{x+1}$, then $f'(3) =$
 A $-\frac{1}{8}$ B $\frac{1}{8}$ C $\frac{1}{16}$ D $\frac{1}{4}$

- 20) The tangent line of $f(x) = x^3 - 3$ at $(1, -2)$ is $y = 3(x-1) - 2$
 A $y = x - 3$ B $y = 3x + 5$ C $y = 3x - 5$ D $y = x - 1$
- 21) If $y = \sqrt{2x^3 - x^2}$, then $y' = \left(\frac{1}{2}(2x^3 - x^2)^{-1/2} * (6x^2 - 2x)\right)$
 A $\frac{x(3x-1)}{2\sqrt{2x^3 - x^2}}$ B $\frac{3x-1}{\sqrt{2x^3 - x^2}}$ C $\frac{3x-1}{2\sqrt{2x^3 - x^2}}$ D $\frac{x(3x-1)}{\sqrt{2x^3 - x^2}}$
- 22) The function $f(x) = \sqrt{4-x^2}$ is continuous on $4-x^2 \geq 0$
 A $(-\infty, \infty)$ B $[-2, 2]$ C $(-2, 2)$ D $[-2, 2)$ $\frac{-x^2 \geq -4}{\sqrt{x^2} \leq 2}$
- 23) If $y = (x^4 - 5)^7$, then $y' = 7(x^4 - 5)^6 * (4x^3)$ $x \leq \pm 2$
 A $28(x^4 - 5)^6$ B $28x^3(x^4 - 5)^6$ C $28x^3(x^4 - 5)^8$ D $7x^3(x^4 - 5)^6$
- 24) If $y = x^5 + 3x^2 - 1$, then $y^{(5)} =$
 A 0 B $60x^2$ C 120 D $120x$
- 25) If $y = (x^2 - 1)(x^3 + 2)$, then $y' = x^5 + 2x^2 - x^3 - 2$
 A $5x^4 - 3x^2 + 4x$ B $5x^4 - 3x^2$ C $5x^4 + 3x^2 + 4x$ D $3x^4 - 3x^2 + 4x$
 $5x^4 + 4x - 3x^2 + 5x^4 - 3x^2 + 4x$
- 26) If $y = \frac{x^4 - 3x^2}{x}$, then $y' =$
 A $3(x^2 - 2)$ B $3x(x - 1)$ C $3(x^2 - 1)$ D $3(x^3 - 1)$
 $(x^4 - 3x^2)(x^{-1})$ $x^3 - 3x$ $3x^2 - 3$ $3(x^2 - 1)$
- 27) $\lim_{x \rightarrow 1^-} \frac{2|x-1|}{1-x} = \infty$
 A 1 B 2 C -2 D does not exist
 $-101-1$ -100 $\frac{200}{51}$ $\frac{100}{51}$ $\frac{2}{51}$
- 28) If $(x^3 - 5) \leq f(x) \leq \sqrt{x+1}$, then $\lim_{x \rightarrow 8} f(x) =$ $3 \leq x \leq 3$
 A -3 B ∞ C does not exist D 3
- 29) If $y = x\sqrt{x}$, then $y' = x(x)^{1/2}$ $x^{3/2}$ $\frac{3}{2}x^{1/2}$ $\frac{3}{2}\sqrt{x}$
 A $\frac{2}{3}\sqrt{x}$ B $\frac{3}{2}\sqrt{x}$ C $\frac{3}{2}\sqrt{x}$ D $-\frac{3}{2}\sqrt{x}$
- 30) If $y = \pi^2$, then $\frac{dy}{dx} =$
 A 0 B π^3 C 2π D π

With best wishes