

High School Differential Calculus Test Questions:

1. By definition, $f'(a) = \lim_{x \rightarrow 0} \frac{f(a+x) - f(a)}{x}$. True or False
2. If $y = 6e^{-3x}$, then $\frac{dy}{dx} = -3y$. True or False
3. If $y = \sin x - 2 \cos x$, then $\frac{d^2y}{dx^2} = y$. True or False
4. For $x \neq 0$, $\frac{d|x|}{dx} = \frac{|x|}{x}$. True or False
5. $\lim_{t \rightarrow 0} \frac{(1+t)^{-2} - 1}{t} =$
A. 1 B. 2 C. -1 D. -2
6. $\lim_{y \rightarrow 4} \frac{y - 4}{\sqrt{2y + 1} - 3} =$
A. 1 B. 2 C. 3 D. 6
7. The number of vertical asymptotes to the graph of $f(x) = \frac{x^2 + 5x + 6}{x^2 - 4}$ is
A. 0 B. 1 C. 2 D. 3
8. The range of the function $f(x) = \frac{x^2 - 1}{x^2 + 1}$ is
A. $1 > y \geq -1$ B. $y \geq -1$ C. $y > -1$ D. $1 \geq y > -1$
9. The number of inflection points on the graph of $f(x) = 3x^5 - 5x^4$ is
A. 0 B. 1 C. 2 D. 3
10. If m is the minimum value of $f(x) = x^{5/3} + 5x^{2/3}$ on the interval $-5 \leq x \leq 1$ and M is the maximum value of $f(x) = x^{5/3} + 5x^{2/3}$ on the interval $-5 \leq x \leq 1$, then the value of $m + M$ is
A. $3 \times 2^{2/3}$ B. $3 + 2^{2/3}$ C. $3 - 2^{2/3}$ D. 6