# Class 11 Mathematics · Chapter 12: Limits and Derivatives

**Worksheet** · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

Scan for the free Class 11 Mathematics test

**1.** The value of $\lim_{x \to 4} \frac{\sqrt{x} - 2}{x - 4}$ is [1]

(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{1}{8}$ (d) 4

**2.** If $\lim_{x \to 2} \frac{x^2 + ax - 6}{x - 2}$ exists (as a real number), then its value is [1]

(a) 5 (b) −5

(c) 1 (d) 4

**3.** If $\lim_{x \to 2} (x^2 + kx + 1) = 11$, then the value of k is [1]

(a) 3 (b) 5

(c) −3 (d) 2

**4.** The value of $\lim_{x \to 2} \frac{x^5 - 32}{x - 2}$ is [1]

(a) 40 (b) 32

(c) 16 (d) 80

**5.** Let $f(x) = x^2 - 1$ for $x \neq 2$ and $f(2) = 0$. Then $\lim_{x \to 2} f(x) - f(2)$ equals [1]

(a) 0 (b) 3

(c) −3 (d) 4

**6.** Find the derivative of $x\sqrt{x} + \frac{1}{\sqrt{x}}$ and its value at $x = 1$. [2]

**7.** If $y = x^2 \cos x$, show that $x \frac{dy}{dx} = 2y - x^3 \sin x$. [2]

**8.** Evaluate $\lim_{x \to 0} \frac{\sin 2x + \sin 4x}{x}$. [2]

**9.** Using Theorem 2 on standard limits, evaluate $\lim_{x \to 1} \frac{x^4 + x^2 - 2}{x - 1}$. [3]



Every question original, written from NCERT, checked by a second reviewer · photocopy freely for your class

**10.** Differentiate $\frac{x^2+1}{x^2-1}$, $x \neq \pm 1$. [3]

**11.** Find the derivative of $f(x) = \sqrt{x}$, $x > 0$, from the first principle. [3]



Every question original, written from NCERT, checked by a second reviewer · photocopy freely for your class