

CLASS 11

MATHS

EXTRA QUESTIONS

Class 11 Maths Chapter 12 Limits and Derivatives – Extra Questions with Answers

Extra practice questions for Class 11 Maths Chapter 12 (Limits and Derivatives), beyond the textbook. These Class 11 Maths Chapter 12 important questions are handy for last-minute exam practice.

Contents

- Very Short Answer Questions (1 mark)
- Short Answer Questions (2–3 marks)
- Higher-Order Thinking / Application Questions
- Class 11 Maths Chapter 12 – Solutions and Notes

Extra practice questions for Class 11 Maths Chapter 12 (Limits and Derivatives), beyond the textbook. These Class 11 Maths Chapter 12 important questions are handy for last-minute exam practice.

Very Short Answer Questions (1 mark)

Q1. Find $\lim_{x \rightarrow 2} (x^2+3)$.

Ans: $2^2+3 = 7$.

Q2. Find the derivative of x^5 .

Ans: $5x^4$.

Q3. Find the derivative of a constant, e.g. $f(x)=5$.

Ans: 0.

Q4. What is $d/dx(\sin x)$?

Ans: $\cos x$.

Q5. Evaluate $\lim_{x \rightarrow 0} (1-\cos x)/x$.

Ans: 0.

Short Answer Questions (2–3 marks)

Q6. Evaluate $\lim_{x \rightarrow 3} (x^2-9)/(x-3)$, noting the expression is indeterminate at $x=3$ initially.

Ans: Factor: $(x^2-9)/(x-3) = (x+3)(x-3)/(x-3) = x+3$ (for $x \neq 3$). So $\lim_{x \rightarrow 3} = 3+3 = 6$.

Q7. Find the derivative of $f(x) = 3x^2 + 5x$ using the standard derivative rules.

Ans: $f'(x) = 3(2x) + 5(1) = 6x + 5$.

Q8. Using the first-principles (limit) definition, find the derivative of $f(x) = x^2$.

Ans: $f'(x) = \lim_{h \rightarrow 0} [(x+h)^2 - x^2]/h = \lim_{h \rightarrow 0} [x^2 + 2xh + h^2 - x^2]/h = \lim_{h \rightarrow 0} [2xh + h^2]/h = \lim_{h \rightarrow 0} (2x + h) = 2x$.

Higher-Order Thinking / Application Questions

Q9. Explain, in conceptual terms, why the derivative is defined as a limit rather than a simple ratio like $[f(x+h)-f(x)]/h$ evaluated at some fixed small h .

Ans: Using a fixed small h would only give an approximate average rate of change over that small interval, not the true instantaneous rate of change at a single point. By taking the limit as h approaches 0 (rather than plugging in a specific small value), we capture the exact, precise rate of change at that exact point, free from the choice of any particular interval size.

Q10. A car's position is given by $s(t) = t^2 + 2t$ (in metres, t in seconds). Find its velocity function using derivatives, and determine the velocity at $t=3$ seconds. Explain the physical meaning of the derivative in this context.

Ans: Velocity $v(t) = s'(t) = 2t + 2$. At $t=3$: $v(3) = 2(3)+2 = 8$ m/s. Physically, the derivative of position with respect to time gives the instantaneous velocity — the exact speed and direction of motion at that precise moment, rather than an average speed over some time interval.

Class 11 Maths Chapter 12 – Solutions and Notes

For complete step-by-step answers and a quick summary, check the [Class 11 Maths Chapter 12 Solutions](#)

and [Class 11 Maths Chapter 12 Revision Notes](#).

See also: [Chapter 2](#) | [Chapter 3](#) | [Chapter 4](#) | [Chapter 5](#) | [Chapter 6](#) | [Chapter 7](#) | [Chapter 8](#) | [Chapter 9](#) | [Chapter 10](#) | [Chapter 11](#) | [Chapter 12](#)

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