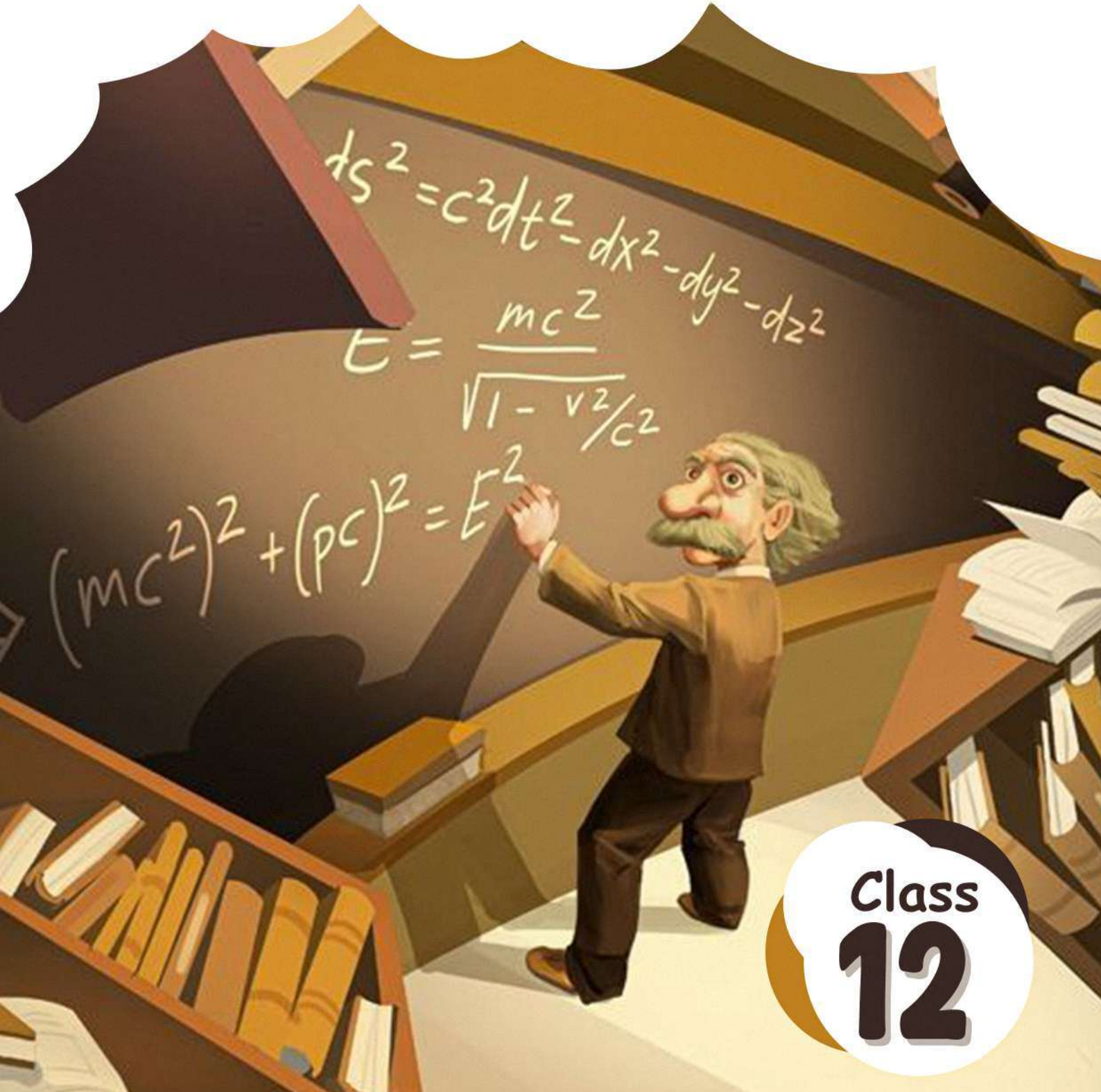
BOARD ZONE

RBSE

CHAPTERWISE PYQ

MATHS

2013 - 2025



Class 12

MATHS

CHAPTERS PAGE NO

01

RELATIONS AND FUNCTIONS

[Section-A]

Multiple Choice Questions:-

1. If $f: R \to R$ be defined $f(x) = x^4$,then the function. [1M]

   (a)f is one-one and onto (b) f is many-one-onto

   (c) f is one-one but not onto (d) f is neither one-one nor onto

   (RBSE 2022)

2. 2. If $f: R \to R$, $f(x)=\sin x$ and $g: R \to R$, $g(x) = x^2$ then $(fog)(x)$ is equal to: [1M]

   (a) $\sin x^2$ (b) $\sin x$

   (c)$\sin^2 x^2$ (d) $\sin^2 x$

   (RBSE 2023)

3. Let R be the relation in the set {1,2,3,4} given by R={(1,2),(2,2),(1,1), (4,4),(1,3),(3,3),(3,2)} choose the correct answer in the given options. [1M]
   (A) R is reflexive and symmetric but not transitive.
   (B) R is reflexive and transitive but not symmetric.
   (C) R is symmetric and transitive but not reflexive.
   (D) R is an equivalence relation.

   (RBSE 2024)

4. Let R be the relation defined on the set N and given by $\{(a, b): a = b - 2, b < 6\}$, then range of R will be -

   A) {1,2,3} B) {1,2,3,4,5}

   C) {3,4,5} D) {3,4,5,6} [1M]

   (RBSE 2025)

Fill in the Blanks :-

5. If $f(x) = 27x^3$ and $g(x) = x^{1/3}$, then $gof(x)$: _____. [1M]

   (RBSE 2022)

Very Short Answer Type Questions:-

6. If $f: R \to R$ and $g: R \to R$, are defined such that $f(x) = x^2 + 3$; $g(x) = 1 - \frac{1}{(1-X)}$ then find $gof(x)$ and $fog(x)$. [1M]
(RBSE 2018)

7. If $f: R \to R$, $f(x) = \sin x$ and $g: R \to R$, $g(x) = x^2$ then find $gof(x)$. [1M]
(RBSE 2019)

8. If $f: R \to R$, $f(x) = x^2 + 5x + 9$, then find the value of $f^{-1}(8)$ and $f^{-1}(9)$. [1M]
(RBSE 2020)

9. Show that the function $f: N \to N$. given by $f(x) = 2x$ is not onto. [1M]
(RBSE 2022)

[Section-B]

Short Answer Type Questions:-

10. If $f: R \to R$, $f(x) = x^2 - 5x + 7$, then find the value of $f^{-1}(1)$. [2M]
(RBSE 2018)

11. If $f(x) = \frac{x-3}{x+1}$, then find $f[f\{f(x)\}]$. [2M]
(RBSE 2019)

12. Considering $f: R \to R$ given by $f(x) = 2x + 3$, prove that f is invertible. [2M]
(RBSE 2016, RBSE 2022)

13. Prove that the relation R in the set {1,2,3} given by $R = \{(1,2), (2,1)\}$ is symmetric but neither reflexive nor transitive. [2M]
(RBSE 2024)

14. If three functions f, g and h are defined in set N, where $f(x) = 2x, g(y) = 3y + 4$ and $h(z) = \sin z \forall x, y$ and $z \in N$, prove that $h \circ (g \circ f) = (h \circ g) \circ f$. [2M]
(RBSE 2025)

[Section-C]

Long Answer Type Questions:-

15. If R and S are equivalence relation in a set A, then show that relation $R \cap S$ is also an equivalence relation. [3M]
(RBSE 2013)

16. Show that the relation R in the set R of real numbers, defined R = {(a, b): $a \le b^2$} is neither reflexive nor symmetric nor transitive. [3M]
(RBSE 2014)

17. Let f : N→Y be a function defined as, $f(x) = 4x + 3$, where Y = {y ∈ N : y = 4x + 3 for some x ∈ N} . Show that f is invertible. Find the inverse function. [3M]
(RBSE 2014)

18. Prove that the relation R defined on set Z as a R b ⇔ a − b is divisible by 3, is an equivalence relation. [3M]
(RBSE 2017,RBSE 2015)

19. If functions f, g : R→R are defined as $f(x) = x^2 + 1$, $g(x) = 2x - 3$, then find f o g (x), g o f(x) and g o g (3). [3M]
(RBSE 2015)

20. Prove that the relation R in set of real numbers R defined as R = {(a, b): a≥b} is reflexive and transitive but not symmetric. [3M]
(RBSE 2016)

21. Consider f: R→R given by f (x) = 2x + 3. Show that f is invertible. Find also the inverse of function f. [3M]
(RBSE 2016, RBSE 2022)

22. Prove that the relation R defined on set Z as a R b⇔ a - b is divisible by 3 is an equivalence relation. [3M]
(RBSE 2015,RBSE 2017)

23. If function f, g : R→R are defined as $f(x) = x^2$, $g(x) = 2x$, then find f o g (x), g o f(x) and f o f (3). [3M]
(RBSE 2017)

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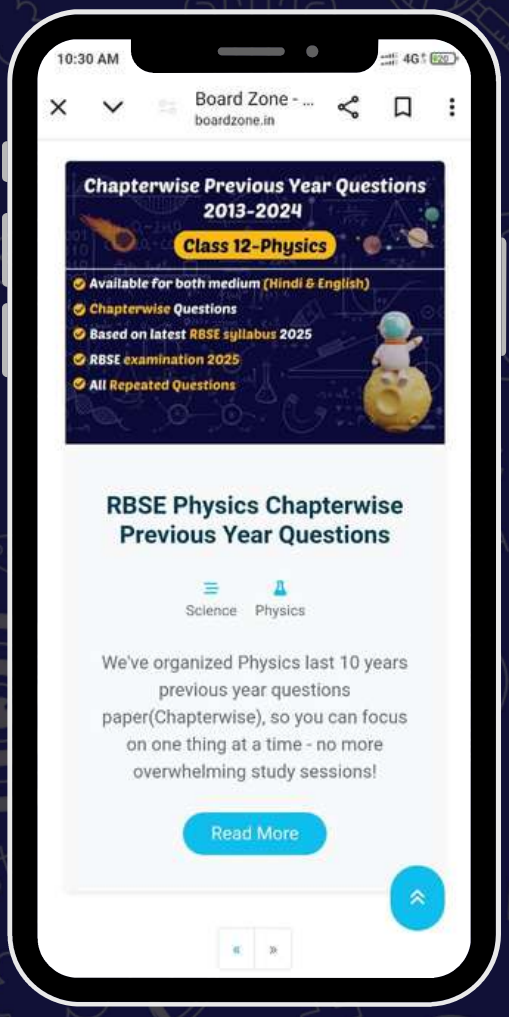

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