

PYQSide

JEE MAIN RELATIONS AND FUNCTIONS — DOMAIN AND RANGE OF FUNCTIONS — PYQS

Max. Marks: 44

Questions: 11

Section A (MCQ)

Q.1 Let $[\cdot]$ denote the greatest integer function. If the domain of the function $f(x) = \sin^{-1}\left(\frac{x + [x]}{3}\right)$ is $[\alpha, \beta]$, then $\alpha^2 + \beta^2$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) 2 (2) 5 (3) 10 (4) 13

Scan or tap for the full solution



Q.2 If the domain of the function $f(x) = \log_{(10x^2 - 17x + 7)}(18x^2 - 11x + 1)$ is $(-\infty, a) \cup (b, c) \cup (d, \infty) - \{e\}$, then $90(a + b + c + d + e)$ equals:

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 170 (2) 316 (3) 177 (4) 307

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Q.3 If the domain of the function $f(x) = \sin^{-1}\left(\frac{5-x}{3+2x}\right) + \frac{1}{\log_e(10-x)}$ is $(-\infty, \alpha] \cup [\beta, \gamma) - \{\delta\}$, then $6(\alpha + \beta + \gamma + \delta)$ is equal to

[JEE Main 2026 (Online) 22nd January Morning Shift]

- (1) 66 (2) 68 (3) 70 (4) 67

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Q.4 Let the domain of the function $f(x) = \log_3 \log_5 (7 - \log_2 (x^2 - 10x + 85)) + \sin^{-1}\left(\left|\frac{3x-7}{17-x}\right|\right)$ be $(\alpha, \beta]$. Then $\alpha + \beta$ is equal to :

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 12 (2) 8 (3) 10 (4) 9

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Q.5 If the range of the function $f(x) = \frac{5-x}{x^2-3x+2}$, $x \neq 1, 2$, is $(-\infty, \alpha] \cup [\beta, \infty)$, then $\alpha^2 + \beta^2$ is equal to :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) 188 (2) 192 (3) 190 (4) 194

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Q.6 Let the domains of the functions $f(x) = \log_4 \log_3 \log_7 (8 - \log_2 (x^2 + 4x + 5))$ and $g(x) = \sin^{-1}\left(\frac{7x+10}{x-2}\right)$ be (α, β) and $[\gamma, \delta]$, respectively. Then $\alpha^2 + \beta^2 + \gamma^2 + \delta^2$ is equal to :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) 15 (2) 13 (3) 16 (4) 14

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Q.7 If the domain of the function $f(x) = \log_e\left(\frac{2x-3}{5+4x}\right) + \sin^{-1}\left(\frac{4+3x}{2-x}\right)$ is $[\alpha, \beta]$, then $\alpha^2 + 4\beta$ is equal to

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 4 (2) 3 (3) 7 (4) 5

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Q.8 If the domain of the function $f(x) = \log_7 (1 - \log_4 (x^2 - 9x + 18))$ is $(\alpha, \beta) \cup (\gamma, \delta)$, then $\alpha + \beta + \gamma + \delta$ is equal to

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 17 (2) 15 (3) 16 (4) 18

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Q.9 If the domain of the function $f(x) = \frac{1}{\sqrt{10+3x-x^2}} + \frac{1}{\sqrt{x+|x|}}$ is (a, b) , then $(1+a)^2 + b^2$ is equal to :

[JEE Main 2025 (Online) 2nd April Evening Shift]

- (1) 29 (2) 30 (3) 25 (4) 26

Scan or tap for the full solution



Section B (Numerical)

Q.10 If the domain of the function $f(x) = \sqrt{\log_{(0.6)}\left(\left|\frac{2x-5}{x^2-4}\right|\right)}$ is $(-\infty, a] \cup \{b\} \cup [c, d) \cup (e, \infty)$, then the value of $a + b + c + d + e$ is _____.

[JEE Main 2026 (Online) 2nd April Morning Shift]

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- Q.11** Let the domain of the function $f(x) = \cos^{-1}\left(\frac{4x+5}{3x-7}\right)$ be $[\alpha, \beta]$ and the domain of $g(x) = \log_2(2 - 6\log_{27}(2x+5))$ be (γ, δ) . Then $|7(\alpha + \beta) + 4(\gamma + \delta)|$ is equal to _____.

[JEE Main 2025 (Online) 8th April Evening Shift]

Scan or tap for the
full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9		
Ans.	2	2	3	4	4	1	1	4	4		

Section B (Numerical)

Ques.	10	11									
Ans.	4	96									