



THE MATH HUB

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INDICES, EXPONENTS, ROOTS & SURDS MCQs

100 FULLY SOLVED MCQs

PPSC, FPSC & ONE PAPER EXAMS

NTS • CSS MPT • PMS • Government Job Tests

Indices • Exponents • Roots • Surds • Rationalization

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INDICES, EXPONENTS, ROOTS & SURDS MCQs | 100 FULLY SOLVED MCQs**Fast Foundation for One-Paper Exams****Product and quotient laws**

$$a^m a^n = a^{m+n}, \quad \frac{a^m}{a^n} = a^{m-n}$$

Power laws

$$(a^m)^n = a^{mn}, \quad (ab)^n = a^n b^n$$

Zero and negative indices

$$a^0 = 1, \quad a^{-n} = \frac{1}{a^n} \quad (a \neq 0)$$

Fractional indices

$$a^{1/n} = \sqrt[n]{a}, \quad a^{m/n} = \sqrt[n]{a^m}$$

Surd simplification

$$\sqrt{ab} = \sqrt{a}\sqrt{b} \quad (a, b \geq 0)$$

Rationalization

$$\frac{1}{\sqrt{a}} = \frac{\sqrt{a}}{a}, \quad \frac{1}{a + \sqrt{b}} \times \frac{a - \sqrt{b}}{a - \sqrt{b}}$$

Laws of Indices and Exponents**MCQ 1**Simplify $2^3 \times 2^5$ as a single power.

- A. 2^8 B. 2^{15}
 C. 2^2 D. 2^9

Solution

$$2^3 \times 2^5 = 2^{3+5} = 2^8$$

Final Answer**2⁸****MCQ 2**Simplify $3^4 \times 3^2$ as a single power.

- A. 3^8 B. 3^6
 C. 3^2 D. 3^7

Solution

$$3^4 \times 3^2 = 3^{4+2} = 3^6$$

Final Answer**3⁶****MCQ 3**Simplify $5^2 \times 5^3$ as a single power.

- A. 5^6 B. 5^1
 C. 5^5 D. 5^4

Solution

$$5^2 \times 5^3 = 5^{2+3} = 5^5$$

Final Answer**5⁵****MCQ 4**Simplify $7^1 \times 7^4$ as a single power.

- A. 7^4 B. 7^3
 C. 7^6 D. 7^5

Solution

$$7^1 \times 7^4 = 7^{1+4} = 7^5$$

Final Answer**7⁵****MCQ 5**Simplify $10^2 \times 10^5$ as a single power.

- A. 10^7 B. 10^{10}
 C. 10^3 D. 10^8

Solution

$$10^2 \times 10^5 = 10^{2+5} = 10^7$$

Final Answer**10⁷****MCQ 6**Simplify $\frac{2^9}{2^4}$ as a single power.

- A. 2^{13} B. 2^5
 C. 2^{36} D. 2^6

Solution

$$\frac{2^9}{2^4} = 2^{9-4} = 2^5$$

Final Answer**2⁵****MCQ 7**Simplify $\frac{3^7}{3^3}$ as a single power.

- A. 3^{10} B. 3^{21}
 C. 3^4 D. 3^5

Solution

$$\frac{3^7}{3^3} = 3^{7-3} = 3^4$$

Final Answer**3⁴****MCQ 8**Simplify $\frac{5^6}{5^2}$ as a single power.

- A. 5^8 B. 5^{12}
 C. 5^5 D. 5^4

Solution

$$\frac{5^6}{5^2} = 5^{6-2} = 5^4$$

Final Answer**5⁴**

MCQ 9Simplify $\frac{7^5}{7^1}$ as a single power.

- A. 7^4 B. 7^6
 C. 7^5 D. 7^3

Solution

$$\frac{7^5}{7^1} = 7^{5-1} = 7^4$$

Final Answer 7^4 **MCQ 10**Simplify $\frac{10^8}{10^3}$ as a single power.

- A. 10^{11} B. 10^5
 C. 10^{24} D. 10^6

Solution

$$\frac{10^8}{10^3} = 10^{8-3} = 10^5$$

Final Answer 10^5 **MCQ 11**Simplify $(2^3)^4$.

- A. 2^7 B. 2^1
 C. 2^{12} D. 2^{13}

Solution

$$(2^3)^4 = 2^{3 \times 4} = 2^{12}$$

Final Answer 2^{12} **MCQ 12**Simplify $(3^2)^5$.

- A. 3^7 B. 3^3
 C. 3^{11} D. 3^{10}

Solution

$$(3^2)^5 = 3^{2 \times 5} = 3^{10}$$

Final Answer 3^{10} **MCQ 13**Simplify $(5^2)^3$.

- A. 5^6 B. 5^5
 C. 5^1 D. 5^7

Solution

$$(5^2)^3 = 5^{2 \times 3} = 5^6$$

Final Answer 5^6 **MCQ 14**Simplify $(7^1)^6$.

- A. 7^7 B. 7^6
 C. 7^5 D. 7^4

Solution

$$(7^1)^6 = 7^{1 \times 6} = 7^6$$

Final Answer 7^6 **MCQ 15**Simplify $(4^3)^2$.

- A. 4^5 B. 4^1
 C. 4^6 D. 4^7

Solution

$$(4^3)^2 = 4^{3 \times 2} = 4^6$$

Final Answer 4^6 **MCQ 16**Write 2^{-5} with a positive exponent.

- A. -2^5 B. $\frac{1}{5^2}$
 C. 2^5 D. $\frac{1}{2^5}$

Solution

$$2^{-5} = \frac{1}{2^5}$$

Final Answer $\frac{1}{2^5}$

MCQ 17Write 3^{-4} with a positive exponent.

- A. $\frac{1}{3^4}$ B. -3^4
 C. $\frac{1}{4^3}$ D. 3^4

Solution

$$3^{-4} = \frac{1}{3^4}$$

Final Answer

$$\frac{1}{3^4}$$

MCQ 18Write 5^{-3} with a positive exponent.

- A. -5^3 B. $\frac{1}{5^3}$
 C. $\frac{1}{3^5}$ D. 5^3

Solution

$$5^{-3} = \frac{1}{5^3}$$

Final Answer

$$\frac{1}{5^3}$$

MCQ 19Write 7^{-2} with a positive exponent.

- A. -7^2 B. $\frac{1}{2^7}$
 C. $\frac{1}{7^2}$ D. 7^2

Solution

$$7^{-2} = \frac{1}{7^2}$$

Final Answer

$$\frac{1}{7^2}$$

MCQ 20Write 10^{-4} with a positive exponent.

- A. -10^4 B. $\frac{1}{4^{10}}$
 C. 10^4 D. $\frac{1}{10^4}$

Solution

$$10^{-4} = \frac{1}{10^4}$$

Final Answer

$$\frac{1}{10^4}$$

Evaluating Powers and Fractional Indices**MCQ 21**Evaluate 2^5 .

- A. 32 B. 16
 C. 25 D. 64

Solution

$$2^5 = 32$$

Final Answer

$$32$$

MCQ 22Evaluate 3^4 .

- A. 27 B. 81
 C. 64 D. 243

Solution

$$3^4 = 81$$

Final Answer

$$81$$

MCQ 23Evaluate 5^3 .

- A. 25 B. 75
 C. 125 D. 625

Solution

$$5^3 = 125$$

Final Answer

$$125$$

MCQ 24Evaluate 10^0 .

- A. 0 B. 10
 C. 100 D. 1

Solution

$$10^0 = 1$$

Final Answer

$$1$$

MCQ 25Evaluate $16^{1/2}$.

- A. 4 B. 2
 C. 8 D. 16

Solution

$$16^{1/2} = 4$$

Final Answer

$$4$$

MCQ 34If $10^x = 100000$, find x .

- A. 4 B. 5
C. 6 D. 10

Solution

$$100000 = 10^5$$

$$10^x = 10^5 \Rightarrow x = 5$$

Final Answer

$$x = 5$$

MCQ 35If $4^x = 64$, find x .

- A. 2 B. 4
C. 3 D. 6

Solution

$$64 = 4^3$$

$$4^x = 4^3 \Rightarrow x = 3$$

Final Answer

$$x = 3$$

MCQ 36If $7^x = 343$, find x .

- A. 2 B. 4
C. 6 D. 3

Solution

$$343 = 7^3$$

$$7^x = 7^3 \Rightarrow x = 3$$

Final Answer

$$x = 3$$

MCQ 37If $2^x = 1024$, find x .

- A. 10 B. 9
C. 11 D. 20

Solution

$$1024 = 2^{10}$$

$$2^x = 2^{10} \Rightarrow x = 10$$

Final Answer

$$x = 10$$

MCQ 38If $9^x = 729$, find x .

- A. 2 B. 3
C. 4 D. 6

Solution

$$729 = 9^3$$

$$9^x = 9^3 \Rightarrow x = 3$$

Final Answer

$$x = 3$$

MCQ 39If $8^x = 512$, find x .

- A. 2 B. 4
C. 3 D. 6

Solution

$$512 = 8^3$$

$$8^x = 8^3 \Rightarrow x = 3$$

Final Answer

$$x = 3$$

MCQ 40If $6^x = 216$, find x .

- A. 2 B. 4
C. 6 D. 3

Solution

$$216 = 6^3$$

$$6^x = 6^3 \Rightarrow x = 3$$

Final Answer

$$x = 3$$

Square Roots, Cube Roots and Perfect Powers**MCQ 41**Find $\sqrt{144}$.

- A. 12 B. 11
C. 13 D. 24

Solution

$$144 = 12^2$$

$$\sqrt{144} = 12$$

Final Answer

$$12$$

MCQ 42Find $\sqrt{225}$.

A. 14

B. 15

C. 16

D. 30

Solution

$$225 = 15^2$$

$$\sqrt{225} = 15$$

Final Answer

15

MCQ 46Find $\sqrt{784}$.

A. 27

B. 28

C. 29

D. 56

Solution

$$784 = 28^2$$

$$\sqrt{784} = 28$$

Final Answer

28

MCQ 43Find $\sqrt{324}$.

A. 17

B. 19

C. 18

D. 36

Solution

$$324 = 18^2$$

$$\sqrt{324} = 18$$

Final Answer

18

MCQ 47Find $\sqrt{900}$.

A. 29

B. 31

C. 30

D. 60

Solution

$$900 = 30^2$$

$$\sqrt{900} = 30$$

Final Answer

30

MCQ 44Find $\sqrt{441}$.

A. 20

B. 22

C. 42

D. 21

Solution

$$441 = 21^2$$

$$\sqrt{441} = 21$$

Final Answer

21

MCQ 48Find $\sqrt{1024}$.

A. 31

B. 33

C. 64

D. 32

Solution

$$1024 = 32^2$$

$$\sqrt{1024} = 32$$

Final Answer

32

MCQ 45Find $\sqrt{625}$.

A. 25

B. 24

C. 26

D. 50

Solution

$$625 = 25^2$$

$$\sqrt{625} = 25$$

Final Answer

25

MCQ 49Find $\sqrt{1225}$.

A. 35

B. 34

C. 36

D. 70

Solution

$$1225 = 35^2$$

$$\sqrt{1225} = 35$$

Final Answer

35

MCQ 50Find $\sqrt{1600}$.

- A. 39 B. 40
C. 41 D. 80

Solution

$$1600 = 40^2$$

$$\sqrt{1600} = 40$$

Final Answer

40

MCQ 51Find $\sqrt[3]{64}$.

- A. 3 B. 5
C. 4 D. 8

Solution

$$64 = 4^3$$

$$\sqrt[3]{64} = 4$$

Final Answer

4

MCQ 52Find $\sqrt[3]{125}$.

- A. 4 B. 6
C. 10 D. 5

Solution

$$125 = 5^3$$

$$\sqrt[3]{125} = 5$$

Final Answer

5

MCQ 53Find $\sqrt[3]{216}$.

- A. 6 B. 5
C. 7 D. 12

Solution

$$216 = 6^3$$

$$\sqrt[3]{216} = 6$$

Final Answer

6

MCQ 54Find $\sqrt[3]{343}$.

- A. 6 B. 7
C. 8 D. 14

Solution

$$343 = 7^3$$

$$\sqrt[3]{343} = 7$$

Final Answer

7

MCQ 55Find $\sqrt[3]{512}$.

- A. 7 B. 9
C. 8 D. 16

Solution

$$512 = 8^3$$

$$\sqrt[3]{512} = 8$$

Final Answer

8

MCQ 56Find $\sqrt[3]{729}$.

- A. 8 B. 10
C. 18 D. 9

Solution

$$729 = 9^3$$

$$\sqrt[3]{729} = 9$$

Final Answer

9

MCQ 57Find $\sqrt[3]{1000}$.

- A. 10 B. 9
C. 11 D. 20

Solution

$$1000 = 10^3$$

$$\sqrt[3]{1000} = 10$$

Final Answer

10

MCQ 58Find $\sqrt[3]{1728}$.

- A. 11 B. 12
C. 13 D. 24

Solution

$$1728 = 12^3$$

$$\sqrt[3]{1728} = 12$$

Final Answer

12

MCQ 59Find $\sqrt[3]{2197}$.

- A. 12 B. 14
C. 13 D. 26

Solution

$$2197 = 13^3$$

$$\sqrt[3]{2197} = 13$$

Final Answer

13

MCQ 60Find $\sqrt[3]{3375}$.

- A. 14 B. 16
C. 30 D. 15

Solution

$$3375 = 15^3$$

$$\sqrt[3]{3375} = 15$$

Final Answer

15

Simplifying and Operating on Surds**MCQ 61**Simplify $\sqrt{8}$.

- A. $2\sqrt{2}$ B. $3\sqrt{2}$
C. $2\sqrt{3}$ D. $\sqrt{2}$

Solution

$$\sqrt{8} = \sqrt{4 \times 2} = 2\sqrt{2}$$

Final Answer $2\sqrt{2}$ **MCQ 62**Simplify $\sqrt{12}$.

- A. $3\sqrt{2}$ B. $2\sqrt{3}$
C. $3\sqrt{3}$ D. $2\sqrt{4}$

Solution

$$\sqrt{12} = \sqrt{4 \times 3} = 2\sqrt{3}$$

Final Answer $2\sqrt{3}$ **MCQ 63**Simplify $\sqrt{18}$.

- A. $2\sqrt{3}$ B. $4\sqrt{2}$
C. $3\sqrt{2}$ D. $3\sqrt{3}$

Solution

$$\sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$$

Final Answer $3\sqrt{2}$ **MCQ 64**Simplify $\sqrt{20}$.

- A. $5\sqrt{2}$ B. $3\sqrt{5}$
C. $2\sqrt{6}$ D. $2\sqrt{5}$

Solution

$$\sqrt{20} = \sqrt{4 \times 5} = 2\sqrt{5}$$

Final Answer $2\sqrt{5}$ **MCQ 65**Simplify $\sqrt{27}$.

- A. $3\sqrt{3}$ B. $4\sqrt{3}$
C. $3\sqrt{4}$ D. $\sqrt{3}$

Solution

$$\sqrt{27} = \sqrt{9 \times 3} = 3\sqrt{3}$$

Final Answer $3\sqrt{3}$

MCQ 66Simplify $\sqrt{32}$.

A. $2\sqrt{4}$

B. $4\sqrt{2}$

C. $5\sqrt{2}$

D. $4\sqrt{3}$

Solution

$$\sqrt{32} = \sqrt{16 \times 2} = 4\sqrt{2}$$

Final Answer

$$4\sqrt{2}$$

MCQ 67Simplify $\sqrt{45}$.

A. $5\sqrt{3}$

B. $4\sqrt{5}$

C. $3\sqrt{5}$

D. $3\sqrt{6}$

Solution

$$\sqrt{45} = \sqrt{9 \times 5} = 3\sqrt{5}$$

Final Answer

$$3\sqrt{5}$$

MCQ 68Simplify $\sqrt{48}$.

A. $3\sqrt{4}$

B. $5\sqrt{3}$

C. $4\sqrt{4}$

D. $4\sqrt{3}$

Solution

$$\sqrt{48} = \sqrt{16 \times 3} = 4\sqrt{3}$$

Final Answer

$$4\sqrt{3}$$

MCQ 69Simplify $\sqrt{50}$.

A. $5\sqrt{2}$

B. $2\sqrt{5}$

C. $6\sqrt{2}$

D. $5\sqrt{3}$

Solution

$$\sqrt{50} = \sqrt{25 \times 2} = 5\sqrt{2}$$

Final Answer

$$5\sqrt{2}$$

MCQ 70Simplify $\sqrt{72}$.

A. $2\sqrt{6}$

B. $6\sqrt{2}$

C. $7\sqrt{2}$

D. $6\sqrt{3}$

Solution

$$\sqrt{72} = \sqrt{36 \times 2} = 6\sqrt{2}$$

Final Answer

$$6\sqrt{2}$$

MCQ 71Simplify $2\sqrt{5} + 3\sqrt{5}$.

A. $6\sqrt{5}$

B. $5\sqrt{6}$

C. $5\sqrt{5}$

D. $1\sqrt{5}$

Solution

$$2\sqrt{5} + 3\sqrt{5} = (2 + 3)\sqrt{5} = 5\sqrt{5}$$

Final Answer

$$5\sqrt{5}$$

MCQ 72Simplify $4\sqrt{7} + 1\sqrt{7}$.

A. $4\sqrt{7}$

B. $5\sqrt{8}$

C. $3\sqrt{7}$

D. $5\sqrt{7}$

Solution

$$4\sqrt{7} + 1\sqrt{7} = (4 + 1)\sqrt{7} = 5\sqrt{7}$$

Final Answer

$$5\sqrt{7}$$

MCQ 73Simplify $7\sqrt{2} - 3\sqrt{2}$.

A. $4\sqrt{2}$

B. $21\sqrt{2}$

C. $4\sqrt{3}$

D. $\sqrt{2}$

Solution

$$7\sqrt{2} - 3\sqrt{2} = (7 - 3)\sqrt{2} = 4\sqrt{2}$$

Final Answer

$$4\sqrt{2}$$

MCQ 74Simplify $9\sqrt{3} - 4\sqrt{3}$.

- A. $36\sqrt{3}$ B. $5\sqrt{3}$
 C. $5\sqrt{4}$ D. $\sqrt{3}$

Solution

$$9\sqrt{3} - 4\sqrt{3} = (9 - 4)\sqrt{3} = 5\sqrt{3}$$

Final Answer

$$5\sqrt{3}$$

MCQ 75Simplify $3\sqrt{6} + 2\sqrt{6}$.

- A. $6\sqrt{6}$ B. $5\sqrt{7}$
 C. $5\sqrt{6}$ D. $1\sqrt{6}$

Solution

$$3\sqrt{6} + 2\sqrt{6} = (3 + 2)\sqrt{6} = 5\sqrt{6}$$

Final Answer

$$5\sqrt{6}$$

MCQ 76Simplify $\sqrt{2} \times \sqrt{3}$.

- A. $\sqrt{5}$ B. 6
 C. $\sqrt{1}$ D. $\sqrt{6}$

Solution

$$\sqrt{2}\sqrt{3} = \sqrt{6} = \sqrt{6}$$

Final Answer

$$\sqrt{6}$$

MCQ 77Simplify $\sqrt{3} \times \sqrt{5}$.

- A. $\sqrt{15}$ B. $\sqrt{8}$
 C. 15 D. $\sqrt{2}$

Solution

$$\sqrt{3}\sqrt{5} = \sqrt{15} = \sqrt{15}$$

Final Answer

$$\sqrt{15}$$

MCQ 78Simplify $\sqrt{2} \times \sqrt{7}$.

- A. $\sqrt{9}$ B. $\sqrt{14}$
 C. 14 D. $\sqrt{5}$

Solution

$$\sqrt{2}\sqrt{7} = \sqrt{14} = \sqrt{14}$$

Final Answer

$$\sqrt{14}$$

MCQ 79Simplify $\sqrt{5} \times \sqrt{10}$.

- A. $\sqrt{15}$ B. 50
 C. $5\sqrt{2}$ D. $\sqrt{5}$

Solution

$$\sqrt{5}\sqrt{10} = \sqrt{50} = 5\sqrt{2}$$

Final Answer

$$5\sqrt{2}$$

MCQ 80Simplify $\sqrt{6} \times \sqrt{15}$.

- A. $\sqrt{21}$ B. 90
 C. $\sqrt{9}$ D. $3\sqrt{10}$

Solution

$$\sqrt{6}\sqrt{15} = \sqrt{90} = 3\sqrt{10}$$

Final Answer

$$3\sqrt{10}$$

Rationalization and Mixed High-Yield Patterns**MCQ 81**Rationalize $\frac{1}{\sqrt{2}}$.

- A. $\frac{\sqrt{2}}{2}$ B. $\frac{1}{2}$
 C. $\sqrt{2}$ D. $\frac{2}{\sqrt{2}}$

Solution

$$\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

Final Answer

$$\frac{\sqrt{2}}{2}$$

MCQ 82Rationalize $\frac{1}{\sqrt{3}}$.

- A. $\frac{1}{3}$
C. $\sqrt{3}$

- B. $\frac{\sqrt{3}}{3}$
D. $\frac{3}{\sqrt{3}}$

Solution

$$\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

Final Answer

$$\frac{\sqrt{3}}{3}$$

MCQ 83Rationalize $\frac{1}{\sqrt{5}}$.

- A. $\frac{1}{5}$
C. $\frac{\sqrt{5}}{5}$

- B. $\sqrt{5}$
D. $\frac{5}{\sqrt{5}}$

Solution

$$\frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

Final Answer

$$\frac{\sqrt{5}}{5}$$

MCQ 84Rationalize $\frac{1}{\sqrt{6}}$.

- A. $\frac{1}{6}$
C. $\frac{6}{\sqrt{6}}$

- B. $\sqrt{6}$
D. $\frac{\sqrt{6}}{6}$

Solution

$$\frac{1}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} = \frac{\sqrt{6}}{6}$$

Final Answer

$$\frac{\sqrt{6}}{6}$$

MCQ 85Rationalize $\frac{1}{\sqrt{7}}$.

- A. $\frac{\sqrt{7}}{7}$
C. $\sqrt{7}$

- B. $\frac{1}{7}$
D. $\frac{7}{\sqrt{7}}$

Solution

$$\frac{1}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{7}}{7}$$

Final Answer

$$\frac{\sqrt{7}}{7}$$

MCQ 86Rationalize $\frac{1}{\sqrt{10}}$.

- A. $\frac{1}{10}$
C. $\sqrt{10}$

- B. $\frac{\sqrt{10}}{10}$
D. $\frac{10}{\sqrt{10}}$

Solution

$$\frac{1}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{\sqrt{10}}{10}$$

Final Answer

$$\frac{\sqrt{10}}{10}$$

MCQ 87Rationalize $\frac{1}{\sqrt{11}}$.

- A. $\frac{1}{11}$
C. $\frac{\sqrt{11}}{11}$

- B. $\sqrt{11}$
D. $\frac{11}{\sqrt{11}}$

Solution

$$\frac{1}{\sqrt{11}} \times \frac{\sqrt{11}}{\sqrt{11}} = \frac{\sqrt{11}}{11}$$

Final Answer

$$\frac{\sqrt{11}}{11}$$

MCQ 88Rationalize $\frac{1}{\sqrt{13}}$.

- A. $\frac{1}{13}$ B. $\sqrt{13}$
 C. $\frac{13}{\sqrt{13}}$ D. $\frac{\sqrt{13}}{13}$

Solution

$$\frac{1}{\sqrt{13}} \times \frac{\sqrt{13}}{\sqrt{13}} = \frac{\sqrt{13}}{13}$$

Final Answer

$$\frac{\sqrt{13}}{13}$$

MCQ 89Rationalize $\frac{1}{\sqrt{15}}$.

- A. $\frac{\sqrt{15}}{15}$ B. $\frac{1}{15}$
 C. $\sqrt{15}$ D. $\frac{15}{\sqrt{15}}$

Solution

$$\frac{1}{\sqrt{15}} \times \frac{\sqrt{15}}{\sqrt{15}} = \frac{\sqrt{15}}{15}$$

Final Answer

$$\frac{\sqrt{15}}{15}$$

MCQ 90Rationalize $\frac{1}{\sqrt{17}}$.

- A. $\frac{1}{17}$ B. $\frac{\sqrt{17}}{17}$
 C. $\sqrt{17}$ D. $\frac{17}{\sqrt{17}}$

Solution

$$\frac{1}{\sqrt{17}} \times \frac{\sqrt{17}}{\sqrt{17}} = \frac{\sqrt{17}}{17}$$

Final Answer

$$\frac{\sqrt{17}}{17}$$

MCQ 91Rationalize $\frac{1}{3 + \sqrt{2}}$.

- A. $\frac{3+\sqrt{2}}{7}$ B. $3 + \sqrt{2}$
 C. $\frac{3-\sqrt{2}}{7}$ D. $\frac{1}{7}$

Solution

$$\begin{aligned} \frac{1}{3 + \sqrt{2}} &\times \frac{3 - \sqrt{2}}{3 - \sqrt{2}} \\ &= \frac{3 - \sqrt{2}}{9 - 2} = \frac{3 - \sqrt{2}}{7} \end{aligned}$$

Final Answer

$$\frac{3 - \sqrt{2}}{7}$$

MCQ 92Rationalize $\frac{1}{4 + \sqrt{3}}$.

- A. $\frac{4+\sqrt{3}}{13}$ B. $4 + \sqrt{3}$
 C. $\frac{1}{13}$ D. $\frac{4-\sqrt{3}}{13}$

Solution

$$\begin{aligned} \frac{1}{4 + \sqrt{3}} &\times \frac{4 - \sqrt{3}}{4 - \sqrt{3}} \\ &= \frac{4 - \sqrt{3}}{16 - 3} = \frac{4 - \sqrt{3}}{13} \end{aligned}$$

Final Answer

$$\frac{4 - \sqrt{3}}{13}$$

MCQ 93Rationalize $\frac{1}{5 + \sqrt{6}}$.

- A. $\frac{5-\sqrt{6}}{19}$ B. $\frac{5+\sqrt{6}}{19}$
 C. $5 + \sqrt{6}$ D. $\frac{1}{19}$

Solution

$$\begin{aligned} \frac{1}{5 + \sqrt{6}} &\times \frac{5 - \sqrt{6}}{5 - \sqrt{6}} \\ &= \frac{5 - \sqrt{6}}{25 - 6} = \frac{5 - \sqrt{6}}{19} \end{aligned}$$

Final Answer

$$\frac{5 - \sqrt{6}}{19}$$

MCQ 94Rationalize $\frac{1}{6 + \sqrt{5}}$.

A. $\frac{6+\sqrt{5}}{31}$

B. $\frac{6-\sqrt{5}}{31}$

C. $6 + \sqrt{5}$

D. $\frac{1}{31}$

Solution

$$\begin{aligned} \frac{1}{6 + \sqrt{5}} &\times \frac{6 - \sqrt{5}}{6 - \sqrt{5}} \\ &= \frac{6 - \sqrt{5}}{36 - 5} = \frac{6 - \sqrt{5}}{31} \end{aligned}$$

Final Answer

$$\frac{6 - \sqrt{5}}{31}$$

MCQ 95Rationalize $\frac{1}{7 + \sqrt{3}}$.

A. $\frac{7+\sqrt{3}}{46}$

B. $7 + \sqrt{3}$

C. $\frac{7-\sqrt{3}}{46}$

D. $\frac{1}{46}$

Solution

$$\begin{aligned} \frac{1}{7 + \sqrt{3}} &\times \frac{7 - \sqrt{3}}{7 - \sqrt{3}} \\ &= \frac{7 - \sqrt{3}}{49 - 3} = \frac{7 - \sqrt{3}}{46} \end{aligned}$$

Final Answer

$$\frac{7 - \sqrt{3}}{46}$$

MCQ 96Simplify $\sqrt{50} + \sqrt{8}$.

A. $2\sqrt{2}$

B. $4\sqrt{3}$

C. 8

D. $7\sqrt{2}$

Solution

$$\begin{aligned} \sqrt{50} &= 5\sqrt{2}, \sqrt{8} = 2\sqrt{2} \\ 5\sqrt{2} + 2\sqrt{2} &= 7\sqrt{2} \end{aligned}$$

Final Answer

$$7\sqrt{2}$$

MCQ 97Simplify $\sqrt{75} - \sqrt{12}$.

A. $3\sqrt{3}$

B. $2\sqrt{2}$

C. $4\sqrt{3}$

D. 8

Solution

$$\begin{aligned} \sqrt{75} &= 5\sqrt{3}, \sqrt{12} = 2\sqrt{3} \\ 5\sqrt{3} - 2\sqrt{3} &= 3\sqrt{3} \end{aligned}$$

Final Answer

$$3\sqrt{3}$$

MCQ 98Simplify $(\sqrt{5})^2$.

A. $2\sqrt{2}$

B. 5

C. $4\sqrt{3}$

D. 8

Solution

$$(\sqrt{5})^2 = 5$$

Final Answer

$$5$$

MCQ 99Simplify $\sqrt{2} \cdot \sqrt{18}$.

A. $2\sqrt{2}$

B. $4\sqrt{3}$

C. 6

D. 8

Solution

$$\sqrt{2}\sqrt{18} = \sqrt{36} = 6$$

Final Answer

$$6$$

MCQ 100Simplify $\frac{\sqrt{48}}{\sqrt{3}}$.

A. $2\sqrt{2}$

B. $4\sqrt{3}$

C. 8

D. 4

Solution

$$\frac{\sqrt{48}}{\sqrt{3}} = \sqrt{16} = 4$$

Final Answer

$$4$$

RAPID REVISION GRID | INDICES / ROOTS / SURDS

Indices Add exponents when multiplying same bases; subtract when dividing; multiply exponents for a power of a power.

Roots

$$\sqrt{a^2} = |a|, \quad \sqrt[3]{a^3} = a$$

Perfect-square extraction

$$\sqrt{ka^2} = a\sqrt{k} \quad (a \geq 0)$$

Like surds Only like surds combine: $p\sqrt{m} + q\sqrt{m} = (p + q)\sqrt{m}$.

Conjugates

$$(a + b\sqrt{m})(a - b\sqrt{m}) = a^2 - b^2m$$

Exam check Keep answers exact unless a decimal is explicitly requested.

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