

1. If  $\frac{x}{\sqrt{512}} = \frac{\sqrt{648}}{x}$ , find the value of x.

- A. 24                      B. 12  
C. 48                      D. 36

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Here is the answer and explanation

**Answer :** Option A

**Explanation :**

$$\frac{x}{\sqrt{512}} = \frac{\sqrt{648}}{x}$$
$$\Rightarrow x^2 = \sqrt{512} \times \sqrt{648} = \sqrt{512 \times 648} = \sqrt{2 \times 2 \times 2 \times 64 \times 2 \times 2 \times 2 \times 81} = 2 \times 2 \times 2 \times 8 \times 9$$
$$x = \sqrt{2 \times 2 \times 2 \times 8 \times 9} = 2 \times 4 \times 3 = 24$$

2.  $\sqrt{5.4756} = ?$

- A. 2.24      B. 1.24  
C. 1.34      D. 2.34

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$\sqrt{5.4756} = 2.34$$

3. If  $3\sqrt{5} + \sqrt{125} = 17.88$ , then what will be the value of  $\sqrt{80} + 16\sqrt{5}$ ?

- A. 21.66                      B. 13.41  
C. 22.35                      D. 44.7

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$3\sqrt{5} + \sqrt{125} = 17.88$$

$$\Rightarrow 3\sqrt{5} + \sqrt{25 \times 5} = 17.88$$

$$\Rightarrow 3\sqrt{5} + 5\sqrt{5} = 17.88$$

$$\Rightarrow 8\sqrt{5} = 17.88$$

$$\Rightarrow \sqrt{5} = \frac{17.88}{8} = 2.235$$

$$\sqrt{80} + 16\sqrt{5} = \sqrt{16 \times 5} + 16\sqrt{5}$$

$$= 4\sqrt{5} + 16\sqrt{5} = 20\sqrt{5} = 20 \times 2.235 = 44.7$$

4. The cube root of 0.000729 is

- A. 0.09                      B. 0.9  
C. 0.21                      D. 0.11

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**Answer :** Option A

**Explanation :**

$$(0.000729)^{1/3} = \left(\frac{729}{10^6}\right)^{1/3} = \frac{9}{10^2} = \frac{9}{100} = .09$$

5. What is the least perfect square which is divisible by each of 21, 36 and 66?

- A. 213444                      B. 214434  
C. 214344                      D. 231444

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**Answer :** Option A

**Explanation :**

LCM of 21, 36, 66 = 2772

ie, all multiples of 2772 are divisible by 21, 36 and 66

Prime factorization of 2772 is,

$$2772 = 2 \times 2 \times 3 \times 3 \times 7 \times 11$$

ie, to make it a perfect square, we have to multiply it by 7 and 11

Hence, required number =  $2772 \times 7 \times 11 = 213444$

6.  $\frac{\sqrt{144}}{11} \times \frac{11}{\sqrt{225}} \times \frac{15}{\sqrt{196}}$  is equal to:

- A. 0.85                      B. 0.72  
C. 2.8                        D. 0.4

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Here is the answer and explanation

**Answer :** Option A

**Explanation :**

$$\begin{aligned} & \frac{\sqrt{144}}{11} \times \frac{11}{\sqrt{225}} \times \frac{15}{\sqrt{196}} \\ &= \frac{12}{11} \times \frac{11}{15} \times \frac{15}{14} \\ &= \frac{12}{14} \\ &= \frac{6}{7} \\ &= 0.85 \end{aligned}$$

7.  $(\sqrt{7} - \frac{1}{\sqrt{7}})^2$  simplifies to:

- A.  $\frac{36}{\sqrt{7}}$                       B.  $\frac{7}{36}$   
C.  $\frac{36}{7}$                         D.  $\frac{7}{\sqrt{36}}$

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Here is the answer and explanation

**Answer :** Option C

**Explanation :**

$$\begin{aligned} (\sqrt{7} - \frac{1}{\sqrt{7}})^2 &= (\sqrt{7})^2 - 2 \times \sqrt{7} \times \frac{1}{\sqrt{7}} + (\frac{1}{\sqrt{7}})^2 \\ &= 7 - 2 + \frac{1}{7} = 5 + \frac{1}{7} = \frac{36}{7} \end{aligned}$$

8. The square root of 16641 is

- A. 129                      B. 121

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Here is the answer and explanation

**Answer :** Option A

**Explanation :**

$$\sqrt{16641} = 129$$

9.  $\sqrt{0.0576 \times ?} = 0.24$ .

A. None of these      B. 10

C. 1                      D. 0.1

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Here is the answer and explanation

**Answer :** Option C

**Explanation :**

$$\sqrt{0.0576 \times x} = 0.24$$

$$\Rightarrow 0.0576 \times x = (0.24)^2$$

$$\Rightarrow 0.0576 \times x = 0.0576$$

$$\Rightarrow x = 1$$

10.  $\sqrt{0.000256 \times ?} = 1.6$ .

A. 0.1                  B. 10

C. 10000              D. 1000

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Here is the answer and explanation

**Answer :** Option C

**Explanation :**

$$\sqrt{0.000256 \times x} = 1.6$$

$$\Rightarrow 0.000256 \times x = (1.6)^2$$

$$\Rightarrow 0.000256 \times x = 2.56$$

$$\Rightarrow x = \frac{2.56}{0.000256} = \frac{2560000}{256} = 10000$$

11. How many two-digit numbers satisfy this property : The last digit (units digit) of the square of the two-digit number is 8 ?

A. 1                                  B. 2

C. 3                                  D. None of these

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

A number ending with 8 can never become a perfect square

Let's examine this in detail

$$1 \times 1 = 1$$

Hence, if the unit digit of a number is 1, unit digit of its square is 1

$$2 \times 2 = 4$$

Hence, if the unit digit of a number is 2, unit digit of its square is 4

$$3 \times 3 = 9$$

Hence, if the unit digit of a number is 3, unit digit of its square is 9

$$4 \times 4 = 16$$

Hence, if the unit digit of a number is 4, unit digit of its square is 6

$$5 \times 5 = 25$$

Hence, if the unit digit of a number is 5, unit digit of its square is 5

$$6 \times 6 = 36$$

Hence, if the unit digit of a number is 6, unit digit of its square is 6

$$7 \times 7 = 49$$

Hence, if the unit digit of a number is 7, unit digit of its square is 9

$$8 \times 8 = 64$$

Hence, if the unit digit of a number is 8, unit digit of its square is 4

$$9 \times 9 = 81$$

Hence, if the unit digit of a number is 9, unit digit of its square is 1

$$0 \times 0 = 0$$

Hence, if the unit digit of a number is 0, unit digit of its square is 0

12. if  $a = 0.2917$ , then the value of  $\sqrt{4a^2 - 4a + 1} + 3a$  is :

A. 0.5834

B. 0.2917

C. 1.2917

D. 2.2917

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**Answer :** Option C

**Explanation :**

$$\begin{aligned}\sqrt{4a^2 - 4a + 1} + 3a &= \sqrt{(1)^2 - 2 \times 1 \times 2a + (2a)^2} + 3a = \sqrt{(1 - 2a)^2} + 3a \\ &= 1 - 2a + 3a = 1 + a \\ &= 1 + 0.2917 = 1.2917\end{aligned}$$

13. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 98.01, the number of the member is the group is:

- A. 101  
C. 99

- B. 98  
D. 88

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**Answer :** Option C

**Explanation :**

Let the number of members = n

Then  $n^2 = \text{Total amount of money collected} = 9801 \text{ paise}$

$$\text{ie, } n = \sqrt{9801} = 99$$

i.e., number of members = 99

14. if  $\sqrt{7} = 2.645$ , then find the value of  $\frac{\sqrt{7}}{2} - \frac{10}{\sqrt{7}} + \sqrt{175}$

- A. 7.22  
C. 6.72
- B. 8.92  
D. 10.77

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**Answer :** Option D

**Explanation :**

$$\frac{\sqrt{7}}{2} - \frac{10}{\sqrt{7}} + \sqrt{175}$$

$$= \frac{\sqrt{7}}{2} - \frac{10}{\sqrt{7}} + \sqrt{7 \times 25}$$

$$= \frac{\sqrt{7}}{2} - \frac{10}{\sqrt{7}} + 5\sqrt{7}$$

$$= \frac{(\sqrt{7})^2 - (2 \times 10) + (5\sqrt{7} \times 2\sqrt{7})}{2\sqrt{7}}$$

$$= \frac{7 - 20 + 70}{2\sqrt{7}} = \frac{57}{2\sqrt{7}}$$

$$= \frac{28.5}{\sqrt{7}} = \frac{28.5}{2.645} = \frac{28500}{2645} = 10.77$$

Please note that  $\frac{57}{2\sqrt{7}}$  can be solved further in the below lines as well

$$\begin{aligned} \frac{57}{2\sqrt{7}} &= \frac{57 \times \sqrt{7}}{2\sqrt{7} \times \sqrt{7}} = \frac{57\sqrt{7}}{14} \\ &= \frac{57 \times 2.645}{14} = \frac{150.765}{14} = 10.77 \end{aligned}$$

15. if  $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$  and  $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ , what is the value of  $(x^2 + y^2)$

- A. 15    B. 14  
C. 13    D. 10

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Here is the answer and explanation

**Answer :** Option B

**Explanation :**

$$x = \frac{(\sqrt{3}+1)}{(\sqrt{3}-1)} = \frac{(\sqrt{3}+1)(\sqrt{3}+1)}{(\sqrt{3}-1)(\sqrt{3}+1)} = \frac{(\sqrt{3}+1)^2}{3-1} = \frac{3+2\sqrt{3}+1}{2} = \frac{4+2\sqrt{3}}{2} = 2 + \sqrt{3}$$

$$y = \frac{\sqrt{3}-1}{\sqrt{3}+1} = \frac{(\sqrt{3}-1)(\sqrt{3}-1)}{(\sqrt{3}+1)(\sqrt{3}-1)} = \frac{(\sqrt{3}-1)^2}{3-1} = \frac{3-2\sqrt{3}+1}{2} = \frac{4-2\sqrt{3}}{2} = 2 - \sqrt{3}$$

$$x^2 + y^2 = (2 + \sqrt{3})^2 + (2 - \sqrt{3})^2 = (4 + 4\sqrt{3} + 3) + (4 - 4\sqrt{3} + 3) = 2(4 + 3) = 14$$

16. The square root of  $(14 + 2\sqrt{13})(14 - 2\sqrt{13})$  is

- A. 8    B. 9  
C. 10                                        D. 12

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$\begin{aligned} \sqrt{(14 + 2\sqrt{13})(14 - 2\sqrt{13})} &= \sqrt{(14)^2 - (2\sqrt{13})^2} = \sqrt{196 - (4 \times 13)} \\ &= \sqrt{196 - 52} = \sqrt{144} = 12 \end{aligned}$$

17.  $\sqrt{248 + \sqrt{64}} = ?$

- A. 21    B. 14

C. 12      D. 16

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$\sqrt{248 + \sqrt{64}} = \sqrt{248 + 8} = \sqrt{256} = 16$$

18.  $\sqrt{1\frac{9}{16}}$  =?

A.  $1\frac{1}{6}$       B.  $1\frac{1}{3}$

C.  $1\frac{1}{2}$       D.  $1\frac{1}{4}$

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$\sqrt{1\frac{9}{16}} = \sqrt{\frac{25}{16}} = \frac{\sqrt{25}}{\sqrt{16}} = \frac{5}{4} = 1\frac{1}{4}$$

19.  $\sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}}$  =?

A. 3      B. 4

C. 5      D. 6

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$\begin{aligned} \sqrt{41 - \sqrt{21 + \sqrt{19 - \sqrt{9}}}} &= \sqrt{41 - \sqrt{21 + \sqrt{19 - 3}}} = \sqrt{41 - \sqrt{21 + \sqrt{16}}} \\ &= \sqrt{41 - \sqrt{21 + 4}} = \sqrt{41 - \sqrt{25}} = \sqrt{41 - 5} = \sqrt{36} = 6 \end{aligned}$$

20.  $\sqrt[4]{4\frac{12}{125}}$  =?

A. 1      B.  $1\frac{2}{5}$

C.  $1\frac{3}{5}$       D.  $1\frac{4}{5}$

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Here is the answer and explanation

**Answer :** Option C

**Explanation :**

$$\sqrt[4]{4 \frac{12}{125}} = \sqrt[4]{\frac{512}{125}} = \sqrt[4]{\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}{5 \times 5 \times 5}} = \frac{2 \times 2 \times 2}{5} = \frac{8}{5} = 1 \frac{3}{5}$$

21.  $\sqrt[4]{\sqrt{0.000064}} = ?$

- A. 0.2      B. 0.4  
C. 0.1      D. 0.3

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Here is the answer and explanation

**Answer :** Option A

**Explanation :**

$$\sqrt[4]{\sqrt{0.000064}} = \sqrt[4]{\sqrt{\frac{64}{10^6}}} = \sqrt[4]{\frac{\sqrt{64}}{\sqrt{10^6}}} = \sqrt[4]{\frac{8}{10^3}} = \sqrt[4]{\frac{8}{1000}} = \frac{\sqrt[3]{8}}{\sqrt[3]{10}} = \frac{2}{10} = 0.2$$

22. What is the smallest number by which 3600 be divided to make it a perfect cube?

- A. 110      B. 210  
C. 420      D. 450

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Here is the answer and explanation

**Answer :** Option D

**Explanation :**

$$3600 = 2^4 \times 3^2 \times 5^2$$

ie, the smallest number by which 3600 be divided to make it a perfect cube

$$= 2 \times 3^2 \times 5^2 = 2 \times 9 \times 25 = 450$$

23.  $140\sqrt{?} + 315 = 1015$

- A. 25      B. 15  
C. 5      D. 50

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Here is the answer and explanation

**Answer :** Option A

**Explanation :**

$$140\sqrt{x} + 315 = 1015$$

$$\Rightarrow 140\sqrt{x} = 1015 - 315 = 700 = 140 \times 5$$

$$\Rightarrow \sqrt{x} = 5$$

$$\Rightarrow x = 5^2 = 25$$

24.  $\sqrt{\frac{0.289}{0.00121}} + \sqrt{9} = ?$

A. 18.45      B. 15.45

C. 12.45      D. 15

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**Answer :** Option A

**Explanation :**

$$\sqrt{\frac{0.289}{0.00121}} + \sqrt{9} = \sqrt{\frac{28900}{121}} + 3 = \frac{\sqrt{28900}}{\sqrt{121}} + 3 = \frac{170}{11} + 3 = 15.45 + 3 = 18.45$$

25. A man plants 49284 apple trees in his garden and arranges them so that there are as many rows as there are apples trees in each row. The number of rows is

A. 182

B. 202

C. 222

D. 122

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**Answer :** Option C

**Explanation :**

Let n be the number of rows

$$\text{Then } n \times n = 49284$$

$$\text{ie, } n = \sqrt{49284} = 222$$

26. What is the difference between  $(\sqrt{18} + \sqrt{3})$  and  $(2 + \sqrt{12})$

A.  $3\sqrt{2} - 2\sqrt{3}$

B.  $\sqrt{2} - 2\sqrt{3}$

C.  $2\sqrt{2} - \sqrt{3}$

D.  $2\sqrt{2} + \sqrt{3}$

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**Answer :** Option C

**Explanation :**

$$\begin{aligned}
\text{Difference} &= (\sqrt{18} + \sqrt{3}) - (\sqrt{2} + \sqrt{12}) \\
&= (\sqrt{2 \times 9} + \sqrt{3}) - (\sqrt{2} + \sqrt{3 \times 4}) \\
&= (3\sqrt{2} + \sqrt{3}) - (\sqrt{2} + 2\sqrt{3}) \\
&= 3\sqrt{2} + \sqrt{3} - \sqrt{2} - 2\sqrt{3} \\
&= 2\sqrt{2} - \sqrt{3}
\end{aligned}$$

27. if  $a * b = a + b - \sqrt{ab}$ , then find the value of  $16 * 9$

- A. 14                                  B. 13  
C. 12                                  D. 11

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Here is the answer and explanation

**Answer :** Option B

**Explanation :**

$$\begin{aligned}
16 * 9 &= 16 + 9 - \sqrt{16 \times 9} \\
&= 25 - \sqrt{16 \times 9} \\
&= 25 - (\sqrt{16} \times \sqrt{9}) \\
&= 25 - (4 \times 3) \\
&= 25 - 12 = 13
\end{aligned}$$

$$28. \frac{\frac{1}{\sqrt{9}} - \frac{1}{\sqrt{11}}}{\frac{1}{\sqrt{9}} + \frac{1}{\sqrt{11}}} + \frac{10 + \sqrt{99}}{?} = \frac{1}{2}$$

- A. 1                                  B. 2  
C. 3                                  D. 4

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Here is the answer and explanation

**Answer :** Option B

**Explanation :**

$$\frac{1}{\sqrt{9}} - \frac{1}{\sqrt{11}} + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \left[ \frac{\sqrt{11} - \sqrt{9}}{\sqrt{11} + \sqrt{9}} \right] + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \left[ \frac{(\sqrt{11} - \sqrt{9})(\sqrt{11} - \sqrt{9})}{(\sqrt{11} + \sqrt{9})(\sqrt{11} - \sqrt{9})} \right] + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \frac{(\sqrt{11} - \sqrt{9})^2}{11 - 9} + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \left[ \frac{11 - 2\sqrt{11}\sqrt{9} + 9}{2} \right] + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \left[ \frac{20 - 2\sqrt{99}}{2} \right] + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow (10 - \sqrt{99}) + \left[ \frac{10 + \sqrt{99}}{x} \right] = \frac{1}{2}$$

$$\Rightarrow \frac{(10 - \sqrt{99})(10 + \sqrt{99})}{x} = \frac{1}{2}$$

$$\Rightarrow \frac{(100 - 99)}{x} = \frac{1}{2}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{2}$$

$$\Rightarrow x = 2$$

29. What is the square root of  $(8 + 2\sqrt{15})$ ?

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

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**Answer :** Option B

**Explanation :**

$$\begin{aligned}
8 + 2\sqrt{15} &= 5 + 3 + 2 \times \sqrt{5} \times \sqrt{3} \\
&= (\sqrt{5})^2 + (\sqrt{3})^2 + (2 \times \sqrt{5} \times \sqrt{3}) \\
&= (\sqrt{5} + \sqrt{3})^2
\end{aligned}$$

Hence,  $\sqrt{8 + 2\sqrt{15}} = \sqrt{(\sqrt{5} + \sqrt{3})^2} = \sqrt{5} + \sqrt{3}$

30.  $\frac{1}{(\sqrt{9} - \sqrt{8})} - \frac{1}{(\sqrt{8} - \sqrt{7})} + \frac{1}{(\sqrt{7} - \sqrt{6})} - \frac{1}{(\sqrt{6} - \sqrt{5})} + \frac{1}{(\sqrt{5} - \sqrt{4})} = ?$

- A. 1.5
- B. .25
- C. 0.5
- D. 5

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**Answer :** Option D

**Explanation :**

$$\frac{1}{(\sqrt{9} - \sqrt{8})} = \frac{(\sqrt{9} + \sqrt{8})}{(\sqrt{9} - \sqrt{8})(\sqrt{9} + \sqrt{8})} = \frac{(\sqrt{9} + \sqrt{8})}{9 - 8} = \sqrt{9} + \sqrt{8}$$

Similarly all other terms can be rewritten. Thus,

$$\begin{aligned}
&\frac{1}{(\sqrt{9} - \sqrt{8})} - \frac{1}{(\sqrt{8} - \sqrt{7})} + \frac{1}{(\sqrt{7} - \sqrt{6})} - \frac{1}{(\sqrt{6} - \sqrt{5})} + \frac{1}{(\sqrt{5} - \sqrt{4})} \\
&= (\sqrt{9} + \sqrt{8}) - (\sqrt{8} + \sqrt{7}) + (\sqrt{7} + \sqrt{6}) - (\sqrt{6} + \sqrt{5}) + (\sqrt{5} + \sqrt{4}) \\
&= \sqrt{9} + \sqrt{4} = 3 + 2 = 5
\end{aligned}$$