

Square Roots and Cube Roots

1. By what least number 675 be multiplied to obtain a number which is a perfect cube ?

- a. 5
- b. 6
- c. 7
- d. 8

Correct Option: A

Explanation:

$675 = 5 \times 5 \times 3 \times 3 \times 3$. To make it a perfect cube it must be multiplied by 5.

2. The largest four-digit number which is a perfect cube is

- a. 9999
- b. 9261
- c. 8000
- d. None

Correct Option: B

Explanation:

Clearly 9261 is a perfect cube satisfying the given property.

3. $\sqrt[3]{\sqrt{0.000064}} = ?$

- a. 0.02
- b. 0.2
- c. 2
- d. None

Correct Option: B

Explanation:

$$\sqrt{.000064} = \sqrt{\frac{64}{10^6}} = \frac{8}{10^3} = \frac{8}{1000} = .008$$

$$\sqrt[3]{\sqrt{0.000064}} = \sqrt[3]{.008}$$

$$\sqrt[3]{\frac{8}{1000}} = \frac{2}{10} = 0.2$$

4. If $2*3 = \sqrt{13}$ and $3*4=25$, then the value of $5*12$ is

- a. $\sqrt{17}$
- b. $\sqrt{29}$
- c. 12
- d. 13

Correct Option: D

Explanation

$$a*b = \sqrt{a^2 + b^2}, \text{ So, } 5*12 = \sqrt{5^2 + (12)^2} = \sqrt{25 + 144} = \sqrt{169} = 13$$

5. If $x * y * z = \sqrt{\frac{(x+2)(y+3)}{(z+1)}}$, then $(6*15*3)$ is

- a. 2
- b. 3
- c. 4
- d. None

Correct Option: D

Explanation:

$$(6*15*3) = \sqrt{\frac{(6+2)(15+3)}{(3+1)}} = \sqrt{\frac{8 \times 18}{4}} = \sqrt{36} = 6$$

6. $\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}} = ?$

- a. 3
- b. 4
- c. 6
- d. >6

Correct Option: B

Explanation:

In the given expression, let the value be x.

$$\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}} = x$$

Squaring both sides,

$$12 + \sqrt{12 + \sqrt{12 + \dots}} = x^2$$

$$\Rightarrow 12 + x = x^2$$

$$x^2 - x - 12 = 0 \quad \text{or} \quad (x-4)(x+3) = 0$$

$$\text{or } x = 4$$

7. The least square number which is exactly divisible by 10,12,15 and 18 is

- a. 360
- b. 400
- c. 900
- d. 1600

Correct Option: C

Explanation:

LCM of 10,12,15,18 = 180

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

To make it a perfect square it must be multiplied by 5.

$$\text{Required number} = (2^2 \times 3^2 \times 5^2) = 900$$

8. $\left(\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}\right)$ is equal to

a. $6+\sqrt{35}$

b. $6-\sqrt{35}$

c. 2

d. 1

Correct Option: A

Explanation:

$$\begin{aligned}\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}} &= \left(\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}\right) \times \frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}+\sqrt{5}} = \left(\frac{\sqrt{7}+\sqrt{5}}{7-5}\right)^2 \\ &= \frac{7+5+2\sqrt{7} \times \sqrt{5}}{2} \\ &= \frac{12+2\sqrt{35}}{2} = (6+\sqrt{35})\end{aligned}$$

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

a. 2

b. 3

c. 4

d. None

Correct Option: A

Explanation:

Let $\frac{\frac{1}{\sqrt{9}} - \frac{1}{\sqrt{11}}}{\frac{1}{\sqrt{9}} + \frac{1}{\sqrt{11}}} \times \frac{10+\sqrt{99}}{x} = \frac{1}{2}$. Then,

$$x = \frac{\frac{\sqrt{11}-\sqrt{9}}{\sqrt{11} \times \sqrt{9}}}{\frac{\sqrt{11}+\sqrt{9}}{\sqrt{11} \times \sqrt{9}}} \times (10+\sqrt{99}) \times 2$$

$$x = \frac{\sqrt{11}-\sqrt{9}}{\sqrt{11}+\sqrt{9}} \times (10+\sqrt{99}) \times 2$$

$$x = \frac{\sqrt{11} - \sqrt{9}}{\sqrt{11} + \sqrt{9}} \times \frac{\sqrt{11} - \sqrt{9}}{\sqrt{11} - \sqrt{9}} \times (10 + \sqrt{99}) \times 2$$

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

$$x = (11 + 9 - 2\sqrt{99})(10 + \sqrt{99})$$

$$x = 2(10 - \sqrt{99})(10 + \sqrt{99}) = 2(100 - 99) = 2$$

10. Which one of the following numbers has rational square root?

- a. 0.4
- b. 0.09
- c. 0.9
- d. 0.025

Correct Option: B

Explanation:

$$\sqrt{0.09} = \sqrt{\frac{9}{100}} = \frac{3}{10} = 0.3, \text{ which is rational}$$

0.09 has rational square root.

11. The value of $\sqrt{2}$ upto three places of decimal is

- a. 1.410
- b. 1.412
- c. 1.413
- d. 1.414

Correct Option: D

Explanation:

7	2.00 00 00	1.414
	1	
24	100	
	96	
281	400	
	281	
2824	11900	
	11296	

$$\sqrt{2} = 1.414$$

12. The square root of $(8 + 2\sqrt{5})$ is

- a. $(\sqrt{2} + \sqrt{6})$
- b. $(\sqrt{5} + \sqrt{3})$

c. $(2\sqrt{3} + 5\sqrt{5})$

d. $2 + \sqrt{6}$

Correct Option: B

Explanation:

$$(8 + 2\sqrt{15}) = [(\sqrt{5})^2 + (\sqrt{3})^2 + 2 \times \sqrt{5} \times \sqrt{3}] = (\sqrt{5} + \sqrt{3})^2$$

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

13. If $\sqrt{6} = 2.449$, then the value of $\frac{3\sqrt{2}}{2\sqrt{3}}$ is

a. 0.6122

b. 1.223

c. 1.2245

d. 0.8163

Correct Option: C

Explanation:

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

$$= \frac{2.449}{2} = 1.2245$$

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

a. 0

b. 1

c. 5

d. $1/3$

Correct Option: C

Explanation:

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

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

similarly $\frac{1}{\sqrt{8} - \sqrt{7}} = (\sqrt{8} + \sqrt{7})$

$$\frac{1}{\sqrt{7} - \sqrt{6}} = (\sqrt{7} + \sqrt{6})$$

and $\frac{1}{\sqrt{5} - \sqrt{4}} = (\sqrt{5} + \sqrt{4})$

Given Exp.

=