

- 1) Rationalising factor of $\frac{1}{\sqrt{a}-\sqrt{b}}$ is (a) $\sqrt{a}+\sqrt{b}$ (b) $\sqrt{a}-\sqrt{b}$ (c) $\frac{1}{\sqrt{a}+\sqrt{b}}$ (d) $\frac{1}{\sqrt{a}-\sqrt{b}}$
- 2) A rational number between $\frac{1}{14}$ and $\frac{2}{21}$ is (a) $\frac{1}{14}$ (b) $\frac{2}{27}$ (c) $\frac{5}{14}$ (d) $\frac{5}{21}$
- 3) On adding $2\sqrt{3}$ and $3\sqrt{2}$, we get (a) $5\sqrt{5}$ (b) $5(\sqrt{3}+\sqrt{2})$ (c) $2\sqrt{3}+3\sqrt{2}$ (d) None of these
- 4) Is the number $(5+\sqrt{4})(5-\sqrt{4})$ rational or irrational?
- 5) Find the value of (i) $5\sqrt{6}+3\sqrt{6}$ (ii) $\sqrt{12} \times \sqrt{18}$
- 6) If x and y are non-zero rational and irrational numbers respectively, then is xy necessarily an irrational number? Justify your answer.
- 7) The value of $2.\overline{6} - 0.\overline{9}$ is (a) $\frac{4}{3}$ (b) $\frac{1}{3}$ (c) $\frac{5}{3}$ (d) $\frac{7}{3}$
- 8) If $0.142857142857\dots$ express in the form of $\frac{m}{n}$, then the value of $2m+n$ is (a) 1 (b) 2 (c) 7 (d) 9
- 9) Decimal form of $\frac{1}{17}$ is (a) terminating (b) non-terminating (c) non-terminating non-recurring (d) non-terminating and recurring
- 10) Simplify $(\sqrt{4}-\sqrt{5})(\sqrt{4}+\sqrt{5})$ (a) -1 (b) $\sqrt{3}-\sqrt{5}$ (c) $-4+\sqrt{15}$ (d) $4-2\sqrt{15}$
- 11) Find a rational number and an irrational number between $-\frac{2}{5}$ and $\frac{1}{2}$.
- 12) Express $32.1\overline{235}$ in the form $\frac{p}{q}$.
- 13) Simplify: $\frac{7+\sqrt{3}}{7-\sqrt{3}} + \frac{7-\sqrt{3}}{7+\sqrt{3}}$
- 14) Find the value of $\frac{6}{\sqrt{5}-\sqrt{3}}$, if $\sqrt{3}=1.732$ and $\sqrt{5}=2.236$
- 15) Simplify: $\frac{4-\sqrt{5}}{4+\sqrt{5}} + \frac{4+\sqrt{5}}{4-\sqrt{5}}$
- 16) Simplify: (i) $\frac{\sqrt{24}}{8} + \frac{\sqrt{54}}{9}$ (ii) $3\sqrt{3} + 2\sqrt{27} + \frac{7}{\sqrt{3}}$

IX H.W-2 Answers

1) $\sqrt{a} + \sqrt{b}$ (a)

2) $\frac{1 \times 3}{7 \times 3} \quad \frac{2 \times 3}{7 \times 3}$

$\frac{3}{21} \quad \frac{6}{21}$

$\frac{5}{21}$ (d)

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

4) $(5 + \sqrt{4})(5 - \sqrt{4}) = (5)^2 - (\sqrt{4})^2 = 25 - 4 = 21$, a rational number

5) (i) $5\sqrt{6} + 3\sqrt{6} = 8\sqrt{6}$

(ii) $\sqrt{12} \times \sqrt{18} = 2\sqrt{3} \times 3\sqrt{2} = 6\sqrt{6}$

6) Yes, xy is an irrational number
eg:- $4 \times 2\sqrt{5} = 8\sqrt{5}$, irrational

7) Let $x = 2.666\ldots$

$10x = 26.666\ldots$
 $\underline{9x = 24}$

$x = \frac{24}{9}$

$0.\overline{9} = 1$

$\therefore 2.\overline{6} - 0.\overline{9} = \frac{24}{9} - 1$

$= \frac{24 - 9}{9}$

$= \frac{15}{9} = \frac{5}{3}$ (c)

8) $0.142857142857\ldots = 0.\overline{142857} = \frac{1}{7}$

$\therefore m = 1, n = 7$

$2m + n = 2 + 7 = 9$ (d)

9) non-terminating and recurring (d)

10) $(\sqrt{4} - \sqrt{5})(\sqrt{4} + \sqrt{5}) = (\sqrt{4})^2 - (\sqrt{5})^2 = 4 - 5 = -1$ (a)

11) $-\frac{2}{5}$ and $\frac{1}{2}$

$-\frac{2}{5} = -0.4$

$\frac{1}{2} = 0.5$

A rational number is 0

An irrational number is $0.212212221\ldots$

$$12) \text{ Let } x = 32.12353535\ldots$$

$$100x = 3212.353535\ldots$$

$$10000x = 321235.353535\ldots$$

$$\underline{9900x = 318023}$$

$$x = \frac{318023}{9900} \text{ ; which is in the form } \frac{p}{q}$$

$$\begin{aligned} 13) \frac{7+\sqrt{3}}{7-\sqrt{3}} + \frac{7-\sqrt{3}}{7+\sqrt{3}} &= \frac{(7+\sqrt{3})^2}{(7-\sqrt{3})(7+\sqrt{3})} + \frac{(7-\sqrt{3})^2}{(7+\sqrt{3})(7-\sqrt{3})} \\ &= \frac{49+3+14\sqrt{3}}{49-3} + \frac{49+3-14\sqrt{3}}{49-3} \\ &= \frac{52+14\sqrt{3}+52-14\sqrt{3}}{46} \\ &= \frac{104}{46} = \frac{52}{23} \end{aligned}$$

$$\begin{aligned} 14) \frac{6(\sqrt{5}+\sqrt{3})}{(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})} &= \frac{6(\sqrt{5}+\sqrt{3})}{5-3} = \frac{6(\sqrt{5}+\sqrt{3})}{2} = 3(\sqrt{5}+\sqrt{3}) \\ &= 3(2.236+1.732) \\ &= 3 \times 3.968 = 11.904 \end{aligned}$$

$$\begin{aligned} 15) \frac{(4-\sqrt{5})^2}{(4+\sqrt{5})(4-\sqrt{5})} + \frac{(4+\sqrt{5})^2}{(4-\sqrt{5})(4+\sqrt{5})} \\ &= \frac{16+5-8\sqrt{5}}{16-5} + \frac{16+5+8\sqrt{5}}{16-5} = \frac{21-8\sqrt{5}+21+8\sqrt{5}}{11} \\ &= \frac{42}{11} \end{aligned}$$

$$\begin{aligned} 16) (i) \frac{\sqrt{24}}{8} + \frac{\sqrt{54}}{9} &= \frac{2\sqrt{6}}{84} + \frac{3\sqrt{6}}{93} \\ &= \frac{\sqrt{6} \times 3}{4 \times 3} + \frac{\sqrt{6} \times 4}{3 \times 4} \\ &= \frac{3\sqrt{6}+4\sqrt{6}}{12} = \frac{7\sqrt{6}}{12} \end{aligned}$$

$$\begin{array}{r} 2 \overline{)24} \quad 2 \overline{)54} \\ 2 \overline{)12} \quad 3 \overline{)27} \\ 2 \overline{)6} \quad 3 \overline{)9} \\ 3 \quad 3 \end{array}$$

$$(ii) \ 3\sqrt{3} + 2 \times 3\sqrt{3} + \frac{7\sqrt{3}}{\sqrt{3} \times \sqrt{3}}$$

$$= 3\sqrt{3} + 6\sqrt{3} + \frac{7\sqrt{3}}{3}$$

$$= \frac{9\sqrt{3} + 18\sqrt{3} + 7\sqrt{3}}{3} = \frac{34\sqrt{3}}{\underline{\underline{3}}}$$

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