IX Test-4

1) The value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ = — (a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8

2) After rationalising the denominator of $\frac{7}{3\sqrt{3}-2\sqrt{2}}$, we get the denominator as —
(a) 13 (b) 19 (c) 5 (d) 35

3) $\frac{1}{\sqrt{9}-\sqrt{8}}$ = — (a) $\frac{1}{2}(3-2\sqrt{2})$ (b) $\frac{1}{3+2\sqrt{2}}$ (c) $3-2\sqrt{2}$ (d) $3+2\sqrt{2}$

4) $\sqrt{10}\cdot\sqrt{15}$ = — (a) $6\sqrt{5}$ (b) $5\sqrt{6}$ (c) $\sqrt{25}$ (d) $10\sqrt{5}$

5) Express $0.35\overline{7}$ in the form $\frac{p}{q}$

6) Simplify: $\frac{2+\sqrt{3}}{2-\sqrt{3}} - \frac{2-\sqrt{3}}{2+\sqrt{3}}$

7) Insert a rational and an irrational number between $\sqrt{2}$ and $\sqrt{3}$.

8) Prove that $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{8}}+\frac{1}{\sqrt{8}+\sqrt{9}}=0$

Test-4 (Answers)

1) $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}} = \frac{4\sqrt{2}+4\sqrt{3}}{2\sqrt{2}+2\sqrt{3}}$

$2\underline{|32}$, $2\underline{|16}$, $2\underline{|8}$, $2\underline{|4}$, 2 $\qquad$ $2\underline{|48}$, $2\underline{|24}$, $2\underline{|12}$, $2\underline{|6}$, 3

$= \frac{\cancel{4}^{2}\cancel{(\sqrt{2}+\sqrt{3})}^{1}}{\cancel{2}_{1}\cancel{(\sqrt{2}+\sqrt{3})}_{1}}$

$= 2$ (b)

2) $\frac{7(3\sqrt{3}+2\sqrt{2})}{(3\sqrt{3})^2-(2\sqrt{2})^2} = \frac{7(3\sqrt{3}+2\sqrt{2})}{27-8} = \frac{7(3\sqrt{3}+2\sqrt{2})}{19}$ (b)

3) $\frac{\sqrt{9}+\sqrt{8}}{(\sqrt{9})^2-(\sqrt{8})^2} = \frac{\sqrt{9}+\sqrt{8}}{9-8} = 3+\sqrt{8} = 3+2\sqrt{2}$ (d) $\qquad$ $2\underline{|8}$, $2\underline{|4}$, 2

4) $\sqrt{10}\times\sqrt{15} = \sqrt{2}\times\underline{\sqrt{5}\times\sqrt{5}}\times\sqrt{3} = 5\sqrt{6}$ (b)

5) Let $x = 0.357777\cdots$

$100x = 35.7777\cdots\cdots \longrightarrow (1)$

$1000x = 357.7777\cdots\cdots \longrightarrow (2)$

(2)-(1), $900x = 322$

$x = \frac{322}{900} = \frac{161}{450}$, which is in the form $\frac{p}{q}$

6) $\frac{2+\sqrt{3}}{2-\sqrt{3}} - \frac{2-\sqrt{3}}{2+\sqrt{3}}$

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

$= \frac{(4+3+4\sqrt{3})}{4-3} - \frac{(4+3-4\sqrt{3})}{4-3}$

$= (7+4\sqrt{3}) - (7-4\sqrt{3}) = \cancel{7}+4\sqrt{3}-\cancel{7}+4\sqrt{3} = \underline{\underline{8\sqrt{3}}}$

7) $\sqrt{2} = 1.414$

$\sqrt{3} = 1.732$

a rational no. $= 1.5$

an irrational no. $= 1.515515551\ldots$

8) LHS, $\frac{1}{\sqrt{2}+1}+\frac{1}{\sqrt{3}+\sqrt{2}}+\frac{1}{\sqrt{4}+\sqrt{3}}+\frac{1}{\sqrt{5}+\sqrt{4}}+\frac{1}{\sqrt{6}+\sqrt{5}}+\frac{1}{\sqrt{7}+\sqrt{6}}+\frac{1}{\sqrt{8}+\sqrt{7}}+\frac{1}{\sqrt{9}+\sqrt{8}}$

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

$=\frac{\sqrt{2}-1}{2-1}+\frac{\sqrt{3}-\sqrt{2}}{3-2}+\frac{\sqrt{4}-\sqrt{3}}{4-3}+\frac{\sqrt{5}-\sqrt{4}}{5-4}+\frac{\sqrt{6}-\sqrt{5}}{6-5}+\frac{\sqrt{7}-\sqrt{6}}{7-6}+\frac{\sqrt{8}-\sqrt{7}}{8-7}+\frac{\sqrt{9}-\sqrt{8}}{9-8}$

$=\cancel{\sqrt{2}}-1+\cancel{\sqrt{3}}-\cancel{\sqrt{2}}+\cancel{\sqrt{4}}-\cancel{\sqrt{3}}+\cancel{\sqrt{5}}-\cancel{\sqrt{4}}+\cancel{\sqrt{6}}-\cancel{\sqrt{5}}+\cancel{\sqrt{7}}-\cancel{\sqrt{6}}+\cancel{\sqrt{8}}-\cancel{\sqrt{7}}+\sqrt{9}-\cancel{\sqrt{8}}$

$=-1+\sqrt{9}=-1+3=\underline{\underline{2}}$, RHS