

- Find a rational number between $\frac{1}{5}$ and $\frac{7}{10}$.
- Give three rational numbers lying between $\frac{1}{3}$ and $\frac{1}{2}$.
- Find four rational numbers between $\frac{1}{4}$ and $\frac{1}{3}$.
- Find 7 rational numbers between $\frac{1}{3}$ and $\frac{1}{2}$.
- Find three rational numbers lying between $\frac{-2}{5}$ and $\frac{-1}{5}$.
- Find 10 rational numbers between $\frac{-2}{5}$ and $\frac{1}{2}$.
- Express each decimal as a fraction in simplest form,
 - $0.\bar{8}$
 - $1.2\bar{7}$
 - $0.40\bar{7}$
- Convert (i) $0.4\bar{7}$, (ii) $4.234\bar{8}$ into fractions in the simplest form.
- Express the following in the form of $\frac{p}{q}$, where p and q are integers and $1 \neq 0$.
- Find the value of $2.\bar{6} - 0.\bar{9}$.
- Explain $0.6 + 0.\bar{7} + 0.4\bar{7}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
- Examine whether $\sqrt{2}$ is rational or irrational. (b) show that $\sqrt{2}$ is not a rational number.
- Show that $\sqrt{3}$ is not a rational number.
- Identify the following as rational or irrational.

i. $\sqrt{9}$	vi. $\sqrt{625}$
ii. $5\sqrt{12}$	vii. $(\sqrt{2} - 3)^2$
iii. $\sqrt{1.96}$	viii. $(\sqrt{7} +)(\sqrt{7} - 1)$
iv. $\sqrt{\frac{6}{18}}$	ix. $(\sqrt{2} + \sqrt{3})(\sqrt{7} + \sqrt{5})$
v. $-\sqrt{0.81}$	x. $\frac{14}{2\sqrt{7}}$
- State with reason which of the following are surds and which are not:

i. $\sqrt{98}$	iv. $15\sqrt{20} \div 4\sqrt{45}$
ii. $\sqrt{7} \times \sqrt{28}$	v. $20\sqrt{7} \div 15\sqrt{21}$
iii. $\sqrt[3]{2} \times \sqrt[3]{32}$	
- Rationalise the denominator of

i. $\frac{1}{\sqrt{7}}$	iv. $\frac{1}{\sqrt[5]{36}}$
ii. $\frac{1}{5\sqrt{3}}$	v. $\frac{1}{\sqrt[3]{a} \sqrt[4]{b} \sqrt[5]{c}}$
iii. $\frac{1}{\sqrt[3]{4}}$	
- Rationalise the denominator and simplify:

i. $\frac{26}{\sqrt{13}}$	iii. $\frac{9}{\sqrt{18}}$
ii. $\frac{3}{\sqrt{27}}$	iv. $\frac{16\sqrt{30}}{5\sqrt{48}}$
- Rationalise the denominators of the following:

i. $\frac{1}{2-\sqrt{3}}$	iii. $\frac{1}{\sqrt{2}+\sqrt{3}}$
ii. $\frac{2}{\sqrt{3}-\sqrt{2}}$	iv. $\frac{\sqrt{x}-3}{\sqrt{x}+3}, x \geq 0$

v. $\frac{2\sqrt{3}+6\sqrt{7}}{\sqrt{2}-\sqrt{3}}$

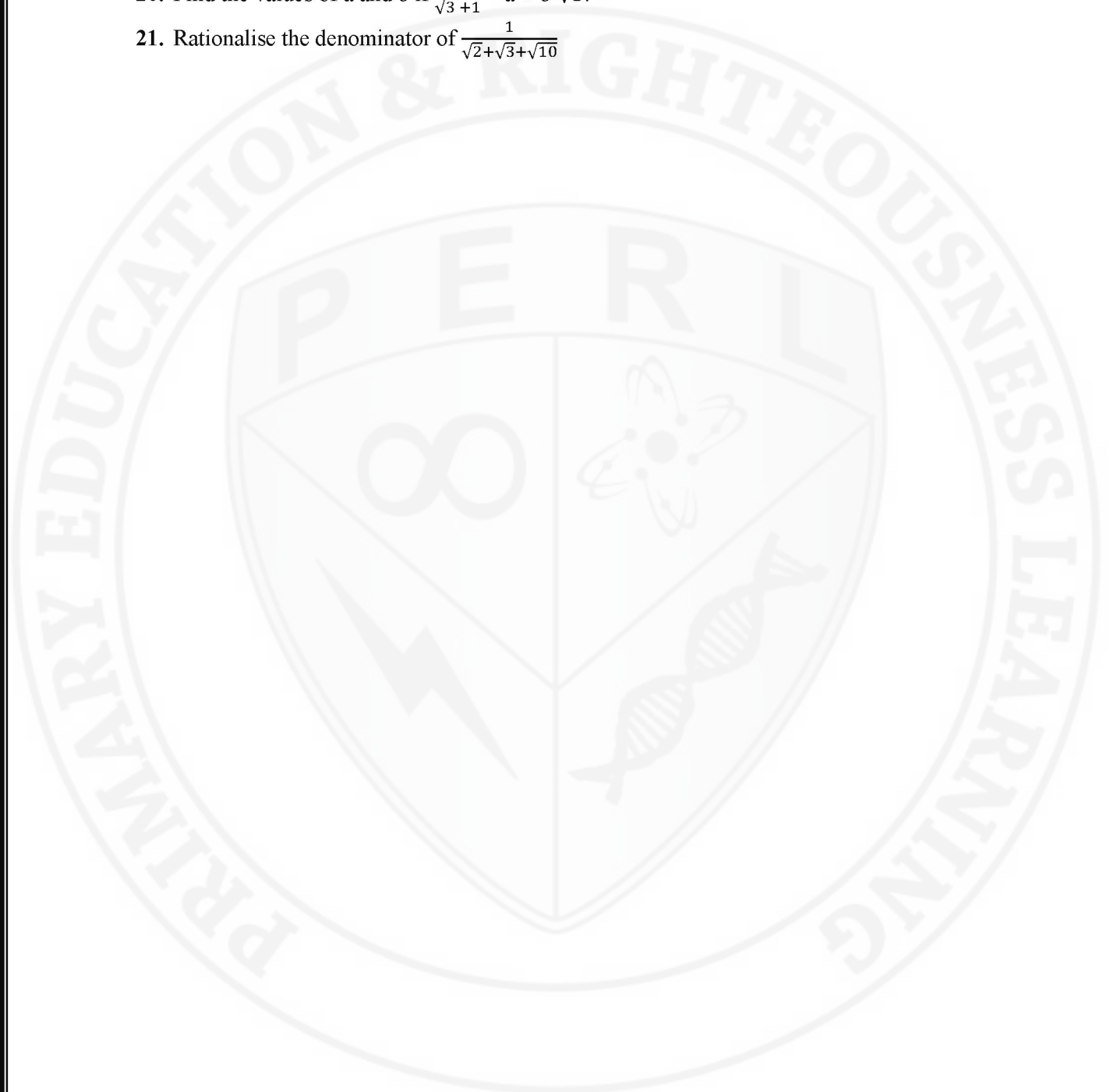
vii. $\frac{y^2}{\sqrt{y^2+y^2+x}}$

vi. $\frac{5-3\sqrt{2}}{5+3\sqrt{2}}$

19. Rationalise the denominator and simplify $\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}}$.

20. Find the values of a and b if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$.

21. Rationalise the denominator of $\frac{1}{\sqrt{2}+\sqrt{3}+\sqrt{10}}$



1. Which of the rational numbers $\frac{3}{5}$ and $\frac{5}{7}$ is greater . Insert three rational numbers between $\frac{3}{5}$ and $\frac{5}{7}$ so that all the five numbers are in ascending order of their values.
2. Without doing any actual division, find whether each of the following is a terminating decimal or not;
 - i. $\frac{17}{50}$
 - ii. $\frac{7}{8}$
 - iii. $\frac{23}{72}$
3. Show that $\sqrt{2}$ is an irrational number.
4. Prove that $\sqrt{5} - \sqrt{3}$ is irrational.
5. Prove that $\sqrt{8} + 5$ is irrational.
6. Identify each of the following as rational or irrational number.
 - i. $\sqrt{12}$
 - ii. $3\sqrt{2} \times \sqrt{8}$
7. Insert a rational number and an irrational number between 3 and 4
8. Find two irrational numbers between 2 and 3
9. Examine each of the following as a rational or an irrational number
 - i. $(3 + \sqrt{2})^2$
 - ii. $(3 + \sqrt{3})(3 - \sqrt{3})$
 - iii. $\frac{6}{\sqrt{3}}$
10. Insert two rational number and two irrational numbers between $\sqrt{3}$ and $\sqrt{7}$
11. Which of the following numbers is grater:
 - i. $3\sqrt{2}$ and $2\sqrt{3}$
 - ii. $6\sqrt[3]{3}$ and $5\sqrt[3]{4}$
12. Compare:
 - i. $\sqrt[3]{4}$ and $\sqrt{3}$
 - ii. $\sqrt[4]{8}$ and $5\sqrt[6]{22}$
13. State, with reasons, which of the following is a surd and which is not:
 - i. $\sqrt{27}$
 - ii. $\sqrt{225} \times \sqrt{4}$
14. Find the least rationalizing factor of :
 - i. $\sqrt{27}$,
 - ii. $2\sqrt{125}$
15. Rationalize the denominator of

i. $\frac{1}{\sqrt{2}}$

ii. $\frac{5}{2\sqrt{2}}$

16. Simplify each of the following by rationalizing the denominator:

i. $\frac{1}{3-\sqrt{7}}$

ii. $\frac{3}{\sqrt{5}+\sqrt{3}}$

iii. $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$

iv. $\frac{7}{\sqrt{15}+2\sqrt{2}}$

v. $\frac{30}{5\sqrt{3}-3\sqrt{5}}$

17. Find the values of 'a' and 'b' " $\frac{2\sqrt{3}-3\sqrt{2}}{2\sqrt{3}-3\sqrt{2}} = a + b\sqrt{6}$."

18. If $x = 2 + \sqrt{3}$, find the value of $x^2 + \frac{1}{x^2}$

19. Prove that $\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{2+\sqrt{3}} = 1$

20. Rationalize the denominator of: $\frac{1}{\sqrt{3}+\sqrt{2}-1}$

21. Evaluate :

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

22. If $\sqrt{3} = 1.73$, find the value of: $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + \frac{\sqrt{3}-1}{\sqrt{3}+1} - \frac{\sqrt{3}+1}{\sqrt{3}-1}$

23. If $x = 3+2\sqrt{3}$, check whether $x + \frac{1}{x}$ is rational or irrational.