Q1. Prove that $3+\sqrt{2}\ is\ irrational$.

Q2. Prove that $6-\sqrt{2}\ is\ irrational$.

Q3. Prove that $5-\sqrt{3}\ is\ irrational$.

Q4. Prove that $3\sqrt{2}\ is\ irrational$.

Q5. Prove that $3\sqrt{2}\ is\ irrational$.

Q6. Prove that $7\sqrt{5}\ is\ irrational$.

Q7. Prove that $\frac{1}{\sqrt{2}}\ is\ irrational$.

$Q8$. Prove that $\frac{1}{\sqrt{5}}\ is\ irrational$.

$Q9$. Prove that $3+2\sqrt{5}\ is\ irrational$.

$Q10$. Prove that $5-2\sqrt{3}\ is\ irrational$.

$Q11$. Prove that $\frac{2\sqrt{3}}{5}\ is\ irrational$.

$Q12$. Prove that $\sqrt{2}+\sqrt{3}\ is\ irrational$.

$Q13$. Prove that $\sqrt{3}+\sqrt{5}\ is\ irrational$.

Q14. Without actually performing the long division, state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion :

$(i)\ \frac{13}{3125}$ $(ii)\ \frac{17}{8}$ $(iii)\ \frac{64}{455}$ $(iv)\ \frac{15}{600}$ $(v)\ \frac{29}{343}$ $(vi)\ \frac{23}{2^3\ 5^2}$ $(vii)\ \frac{129}{2^2\ 5^7\ 7^5}$

$(viii)\ \frac{6}{15}$ $(ix)\ \frac{35}{50}$ $(x)\ \frac{77}{210}$ $(xi)\ \frac{987}{10500}$ $(xii)\ \frac{60}{455}$ $(xiii)\ \frac{17}{500}$ $(xiv)\ \frac{21}{1120}$

$(xv)\ \frac{127}{5^2\ 2^3}$ $(xvi)\ \frac{1717}{2^2\ 5^3}$ $(xvii)\ \frac{3}{8}$ $(xviii)\ \frac{13}{125}$ $(xix)\ \frac{7}{80}$ $(xx)\ \frac{14588}{625}$

Ans. 14

$(i)\ Terminating$ $(ii)\ Terminating$ $(iii)\ Non-terminating\ repeating$ $(iv)\ Terminating$

$(v)\ Non-terminating\ repeating$ $(vi)\ Terminating$ $(vii)\ Non-terminating\ repeating$

$(viii)\ Terminating$ $(ix)\ Terminating$ $(x)\ Non-terminating\ repeating$ $(xi)\ Terminating$

$(xii)\ Non-terminating\ repeating$ $(xiii)\ Terminating$ $(xiv)\ Terminating$ $(xv)\ Terminating$

$(xvi)\ Terminating$ $(xvii)\ Terminating$ $(xviii)\ Terminating$ $(xix)\ Terminating$ $(xx)\ Terminating$

Q15. Write down the decimal expansion of those rational numbers in question 14 above which have terminating decimal expansion.

Ans. 15

$(i)\ 0.00416$ $(ii)\ 2.125$ $(iii)\ ---$ $(iv)\ 0.009375$ $(v)\ ---$ $(vi)\ 0.115$ $(vii)\ ---$

$(viii)\ 0.4$ $(ix)\ 0.7$ $(x)\ ---$ $(xi)\ 0.094$ $(xii)\ ---$ $(xiii)\ 0.034$ $(xiv)\ 0.01875$

$(xv)\ 0.635$ $(xvi)\ 3.434$ $(xvii)\ 0.375$ $(xviii)\ 0.104$ $(xix)\ 0.0875$ $(xx)\ 23.3408$