

INTERNATIONAL INDIAN SCHOOL, RIYADH
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WORK SHEET

CLASS : IX SUBJECT: Mathematics LESSON: Number System.
2012 - 2013

1. Find two rational numbers and two irrational numbers between $\sqrt[3]{8}$ and $\sqrt{9}$
2. Show that the following numbers are rational:
 $\sqrt[3]{343}$, $0.3\overline{25}$, $\sqrt{3} \times \sqrt{12}$, 0.75 , $(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})$
3. Give examples to show that
 - i) The sum of two irrational numbers need not be irrational
 - ii) The product of two irrational numbers need not be irrational
 - iii) The square roots of all positive integers are not necessarily irrational
4. Without actually dividing, find whether the decimal representation of the following rational numbers will be terminating or non-terminating:
 $\frac{23}{8}$, $\frac{35}{50}$, $\frac{77}{210}$, $\frac{189}{125}$, $\frac{51}{300}$, $\frac{343}{700}$
5. Simplify: i) $\sqrt{8} + 3\sqrt{32} - \sqrt{50}$ ii) $\sqrt{12} + \sqrt{192} - \sqrt{147}$ iii) $\sqrt{8} \times \sqrt{50}$
iv) $\sqrt{63} + \sqrt{28} - \sqrt{112}$ v) $\sqrt{45} + \sqrt{80} - 3\sqrt{20}$ vi) $4\sqrt{3} + 2\sqrt{75} - 3\sqrt{12}$
6. Show that $2 + \sqrt{7}$ is an irrational number.
7. Find points on the real-number line, corresponding to:
 $\sqrt{3}$, $\sqrt{5}$, $\sqrt{10}$, $\sqrt{17}$, $\sqrt{9.8}$, 2.123

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8) Simplify by rationalising the denominator:

i) $\frac{3}{\sqrt{2}-1}$

ii) $\frac{1}{7-4\sqrt{3}}$

iii) $\frac{1}{5+2\sqrt{6}}$

iv) $\frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}}$

v) $\frac{3\sqrt{2}}{3\sqrt{2}-\sqrt{5}}$

vi) $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}}$

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

viii) $\frac{\sqrt{2}+1}{\sqrt{5}+\sqrt{3}}$

9) If $a = 9 + 4\sqrt{5}$, find i) $a + \frac{1}{a}$ ii) $a - \frac{1}{a}$

10) If $x = 3 + 2\sqrt{2}$, evaluate $x + \frac{1}{x}$ and $x^2 + \frac{1}{x^2}$

11) If $x = 7 + 4\sqrt{3}$, find i) $x + \frac{1}{x}$ ii) $x^2 + \frac{1}{x^2}$

12) Find rational numbers a and b such that

i) $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

ii) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a + b\sqrt{3}$

13) Simplify: i) $16^{-\frac{3}{4}}$ ii) $(64^{\frac{1}{2}})^{\frac{5}{3}}$ iii) $(343)^{\frac{2}{3}}$ iv) $216^{-\frac{2}{3}}$

v) $12^{\frac{1}{3}} \times 18^{\frac{1}{3}}$

vi) $3 \times 9^{\frac{5}{2}} \times 9^{-\frac{1}{2}}$

vii) $[(512)^{\frac{1}{3}}]^{\frac{5}{3}}$

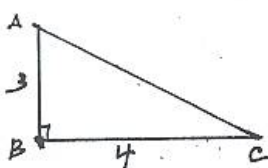
viii) $(17^2 - 15^2)^{\frac{1}{2}}$

ix) $\frac{1}{4} \times 25^{-\frac{1}{2}} (25^{\frac{3}{2}} - 25^{\frac{1}{2}})$

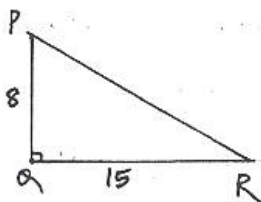
x) $(1^3 + 2^3 + 3^3)^{\frac{1}{2}}$

14) In which right-angled triangle, the length of the hypotenuse is irrational number?

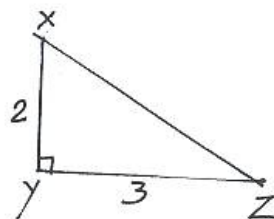
i)



ii)



iii)



15) Simplify: $a^{p-q} \times a^{q-r} \times a^{r-p}$