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) $\frac{3\sqrt{2}}{3\sqrt{2}-\sqrt{15}}$ 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) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a+b\sqrt{3}$

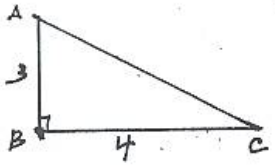
13.) Simplify: i) $16^{-\frac{3}{4}}$ ii) $(64^{\frac{1}{2}})^{\frac{1}{3}}$ iii) $(343)^{\frac{2}{3}}$ iv) $216^{-\frac{2}{3}}$

v) $12^{\frac{1}{3}} \times 18^{\frac{1}{3}}$ vi) $3\times 9^{\frac{5}{2}} \times 9^{-\frac{1}{2}}$ vii) $\left[(512)^{\frac{1}{3}}\right]^{\frac{1}{3}}$

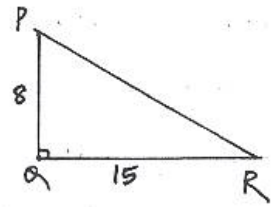
viii) $(17^2-15^2)^{\frac{1}{2}}$ ix) $\frac{1}{4}\times 25^{-\frac{1}{2}}(25^{\frac{3}{2}}-25^{\frac{1}{2}})$ x) $(1^3+2^3+3^3)^{\frac{1}{2}}$

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

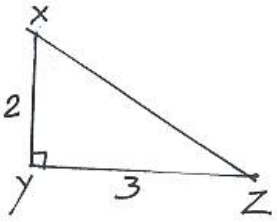
i)



ii)



iii)



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