

# Home Assignment Ch.1 class IX A

1. Prove that  $\sqrt{5} - \sqrt{3}$  is not a rational number.
2. Arrange the following in descending order of magnitude:  $\sqrt[8]{90}, \sqrt[4]{10}, \sqrt{6}$
3. Find  $\frac{1}{19}$
4. If  $a = 6 - \sqrt{35}$ , find the value of  $a^2 + \frac{1}{a^2}$
5. Simplify, by rationalising the denominator  $\frac{2\sqrt{6}}{\sqrt{2} + \sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6} + \sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6} + \sqrt{2}}$
6. In each box there is a number. Encircle N, W, Z, Q, I or  $\bar{Q}$ , R if a given number in the box is so. Symbols used: N for natural numbers, W for whole numbers, Z for integers, Q for rational numbers, I or  $\bar{Q}$  for irrational numbers and R for real numbers.

7 N W Z Q I or $\bar{Q}$ R	- 8 N W Z Q I or $\bar{Q}$ R	11/3 N W Z Q I or $\bar{Q}$ R	0 N W Z Q I or $\bar{Q}$ R	100 N W Z Q I or $\bar{Q}$ R
- 11 N W Z Q I or $\bar{Q}$ R	- 20 N W Z Q I or $\bar{Q}$ R	$\sqrt{2}$ N W Z Q I or $\bar{Q}$ R	$\sqrt{16}$ N W Z Q I or $\bar{Q}$ R	$\pi$ N W Z Q I or $\bar{Q}$ R
1.5368 N W Z Q I or $\bar{Q}$ R	2.35 N W Z Q I or $\bar{Q}$ R	0.10110111... N W Z Q I or $\bar{Q}$ R	$2\sqrt{3}$ N W Z Q I or $\bar{Q}$ R	If $x^2 = - 1$ , then x is N W Z Q I or $\bar{Q}$ R

7. If  $\frac{5 + 2\sqrt{3}}{7 + \sqrt{3}} = a - \sqrt{3} b$ , find a and b where a and b are rational numbers.
8. Evaluate:  $\frac{1}{\sqrt{2} + 1} + \frac{1}{\sqrt{3} + \sqrt{2}} + \frac{1}{\sqrt{4} + \sqrt{3}} + \dots + \frac{1}{\sqrt{9} + \sqrt{8}}$

9. If  $x = \frac{1}{2 + \sqrt{3}}$ , find the value of  $2x^3 - 7x^2 - 2x + 1$
10. If  $\sqrt{2} = 1.414$  and  $\sqrt{5} = 2.236$ , find the value of  $\frac{\sqrt{10} - \sqrt{5}}{2\sqrt{2}}$  up to three places of decimals.
11. If  $x = \frac{\sqrt{2} + 1}{\sqrt{2} - 1}$  and  $y = \frac{\sqrt{2} - 1}{\sqrt{2} + 1}$ , find the value of  $x^2 + y^2 + xy$
12. Represent  $2\sqrt{2}$  on number line.
13. Represent  $3 + \sqrt{2}$  on number line.
14. Represent  $\sqrt{72.8}$  on number line.
15. Represent  $-\sqrt{6}$  on number line.
16. If  $2^x = 3^y = 12^z$ , then show that  $\frac{1}{z} = \frac{1}{y} + \frac{2}{x}$
17. Find a, b given  $3a - 8\sqrt{5} \quad b = \frac{8 + \sqrt{5}}{8 - \sqrt{5}} - \frac{8 - \sqrt{5}}{8 + \sqrt{5}}$
18. Simplify  $\sqrt[4]{81} - 8 \sqrt[3]{216} + 15 \sqrt[5]{32} + \sqrt{225}$
19. Rationalise the denominator  $\frac{1}{\sqrt{3} + \sqrt{7} + 2}$
20. Rationalise the denominator  $\frac{1}{\sqrt{3} + \sqrt{2} + \sqrt{7}}$
21. If  $x = 2\sqrt{2} + 3$
- (a)  $\frac{1}{x} + x$
- (b)  $\frac{1}{x} - x$
- (c)  $\frac{1}{x^2} + x^2$
- (d)  $\frac{1}{x^2} - x^2$
- (e)  $\frac{1}{x^3} + x^3$
- (f)  $\frac{1}{x^3} - x^3$
- (g)  $\frac{1}{\sqrt{x}} + \sqrt{x}$