Real Numbers

1) Find q and r for the following pairs of positive integers a and b, satisfying a = bq + r.
(i) a = 13, b = 3 (ii) a = 80, b = 8 (iii) a = 125, b = 5
(iv) a = 132, b = 11

2) Find the HCF of the following by using Euclid algorithm.
(i) 50 and 70 (ii) 96 and 72 (iii) 300 and 550
(iv) 1860 and 2015

3) Show that every positive even integer is of the form 2q, and that every positive odd integer is of the form 2q + 1, where q is some integer

4) Show that every positive odd integer is of the form 4q + 1 or 4q + 3, where q is some integer.

5) Use Euclid's algorithm to find the HCF of
(i) 900 and 270 (ii) 196 and 38220 (iii) 1651 and 2032

6) Use division algorithm to show that any positive odd integer is of the form 6q + 1, or 6q + 3 or 6q + 5, where q is some integer.

7) Use division algorithm to show that the square of any positive integer is of the form 3p or 3p + 1.

8) Use division algorithm to show that the cube of any positive integer is of the form 9 m, 9m + 1 or 9m + 8.

9) Show that one and only one out of n, n + 2 or n + 4 is divisible by 3, where n is any positive integer

10) Find the HCF and LCM of 12 and 18 by the prime factorization method.

11) Explain why 7*11*13 + 13 and 7*6*5*4*3*2*1 + 5 are composite numbers.

12) How will you show that (17 *11*2) + (17*11*5) is a composite number? Explain.

13) What is the last digit of 6100.

14) Show that 3 2 is irrational.

15) Show that 5 – 3 is irrational.

16) Prove that 2 + 3 is irrational

17) Prove that the following are irrational
(i)1/√2 (ii) √3 + √5 (iii) 6 + √2 (iv) √5 (v) 3 + 2√5

18) Prove that $\sqrt{p} + \sqrt{q}$ is an irrational, where p, q are primes.

19) (a) Express 10, 100, 1000, 10000, 100000 is exponential form
(b) Express in simplest exponential form
(i) 16*64 (ii) 25*125 (iii) 128 *32

20) Express the logarithms of the following as the sum of the logarithm
(i) 35*46 (ii) 235*437 (iii) 2437*3568

21) Expand log343/125

22) Write 2log3 + 3log5 – 5log2 as a single logarithm

23) Is (i) log 2 rational or irrational? Justify your answer.
(ii) log 100 rational or irrational? Justify your answer
24) If (2.3)x = (0.23)y = 1000, then find the value of 1/x - 1/y

25) Find the value of log32