Delhi Public School, Gandhinagar

Academic Session 2020 – 21

Holiday Home – Work

Chapter 1 : Real Numbers

Exercise 1.1

1. Prove that the square of any positive integer is of the form $5q$, $5q + 1$, $5q + 4$ for some integer q.
2. If n is an odd integer, then show that $n^2 - 1$ is divisible by 8.

Exercise 1.2

1. Use Euclid's division algorithm to find the HCF of 441, 567 and 693.
2. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.
3. If the HCF of 408 and 1032 is expressible in the form $1032m - 408 \times 5$, find m.
4. Find the greatest number which divides 285 and 1249 leaving remainders 9 and 7 respectively.
5. A mason has to fit a bathroom with square marble tiles of the largest possible size. The size of the bathroom is 10 ft. by 8 ft. What would be the size in inches of the tile required that has to be cut and how many such tiles are required?

Exercise 1.3

1. Prove that $\sqrt{3} + \sqrt{5}$ is irrational.
2. Prove that $\sqrt{7}$ irrational.

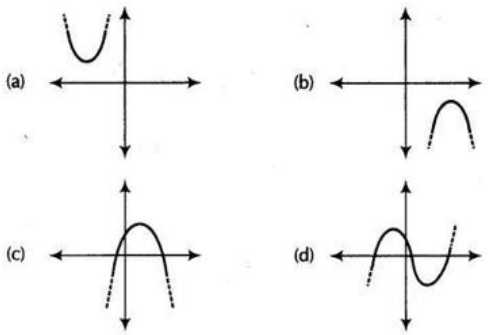
Exercise 1.4

1. A rational number in its decimal expansion is 327.7081. What can you say about the prime factors of q, when this number is expressed in the form $\frac{p}{q}$? Give reasons.
2. Write the denominator of rational number $\frac{257}{5000}$ in the form $2^m \times 5^n$,where m, n are non-negative integers. Hence, write its decimal expansion, without actual division.

Chapter 2 : Polynomials

Exercise 2.1

1. Find number of zeroes for the following:



Exercise 2.2

1. Find the zeroes of each of the following quadratic polynomials and verify the relationship between the zeroes and their coefficients:
   (i) $q(x)=\sqrt{3}x^2 + 10x + 7\sqrt{3}$
   (ii) $p(x) = x^2 + 2\sqrt{2}x - 6$
2. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate:
   (i) $\alpha - \beta$ (ii) $\frac{1}{\alpha} - \frac{1}{\beta}$ (iii) $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$
3. If one zero of the quadratic polynomial $f(x) = 4x^2 - 8kx - 9$ is negative of the other, find the value of k.
4. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - 1$, find a quadratic polynomial whose zeroes are $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$.

Exercise 2.3

1. Obtain all zeroes of the polynomial $f(x) = 2x^4 + x^3 - 14x^2 - 19x - 6$, if two of its zeroes are $-2$and -1.
2. Obtain all zeroes of $f(x) = x^3 + 13x^2 + 32x + 20$, if one of its zeros is -2.
3. What must be added to the polynomial $p(x) = x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$.
4. If $x - \sqrt{5}$ is a factor of the cubic polynomial $x^3 - 3\sqrt{5}x^2 + 13x - 3\sqrt{5}$, then find all the zeroes of the polynomial.

Exercise 2.4

1. Find a cubic polynomial with the sum, sum of the product of its zeroes taken two at a time, and product of its zeros as 4, -1 and -5 respectively.
2. Find *k*, so that $x^2 + 2x + k$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Also, find all the zeroes of the two polynomials.