1. If one zero of a quadratic polynomial $kx^2 + 3x + k$ is 2, then the value of k is

2. The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is

3. The zeroes of the polynomial $x^2 - 3x - m(m+3) = 0$ are

4. If α and β are the zeros of the quadratic equation $f(x) = x^2 - x - 4$, then find the value of

$$1/\alpha + 1/\beta - \alpha\beta$$

5. If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then the value of p is

6. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, where $c \neq 0$, are equal, then
(a) c and a have opposite signs
(b) c and b have opposite signs
(c) c and a have same sign
(d) c and b have the same sign

7.   Assertion : $x^3 + x$ has only one real zero.
    Reason : A polynomial of nth degree must have n real zeroes.

8. Write the polynomial whose zeros are reciprocal of the zeros of $ax^2 + bx + c$

9. For the box to satisfy certain requirements, its length must be three unit greater than the width, and its height must be two unit less than the width.
(i) If width is taken as x , find the polynomial that represent volume of box.
(ii) Find the polynomial that represent the area of paper sheet used to make box
(iii) If it must have a volume of 18 unit, what must be its length and height ?
(iv) If box is made of a paper sheet which cost is Rs 100 per square unit, what is the cost of paper?

10. The discharge rate of a river is a measure of the river's water flow as it empties into a lake, sea, or ocean. The rate depends on many factors, but is primarily influenced by the precipitation in the surrounding area and is often seasonal.
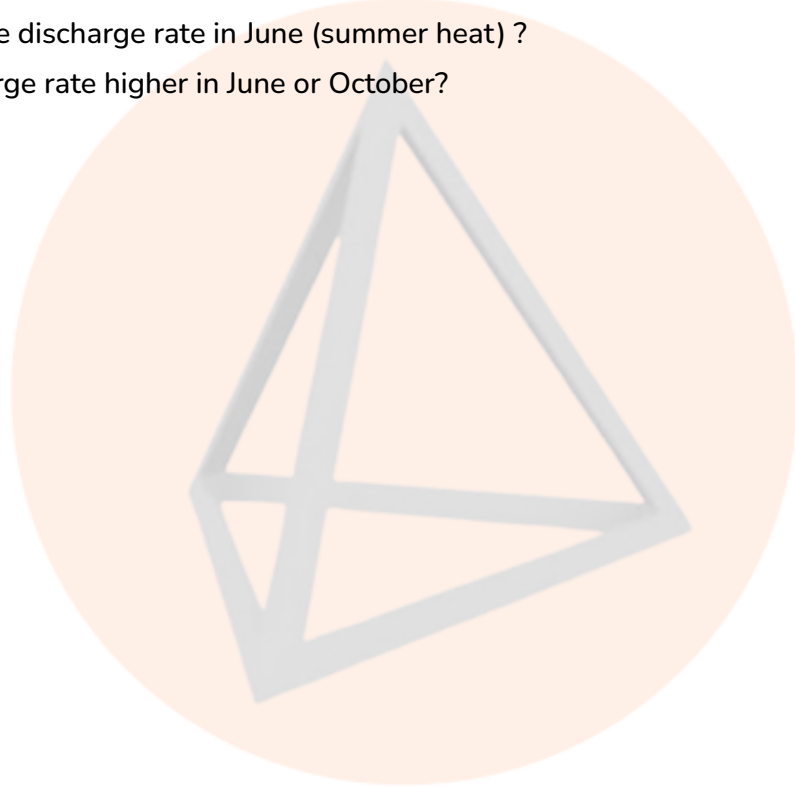
Suppose the discharge rate of the Brahamputra River was modelled by :

$$D(m) = -m^4 + 22m^3 - 147m^2 + 317\,m + 150$$

where D(m) represents the discharge rate in thousands of cubic meters of water per second in month m . (m = 1 means January, m = 2 means February and so on)

(i) What was the discharge rate in June (summer heat) ?

(ii) Is the discharge rate higher in June or October?