



Laying the foundation of lifelong success

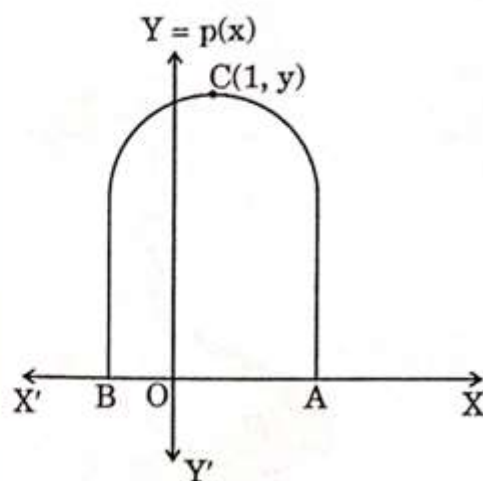
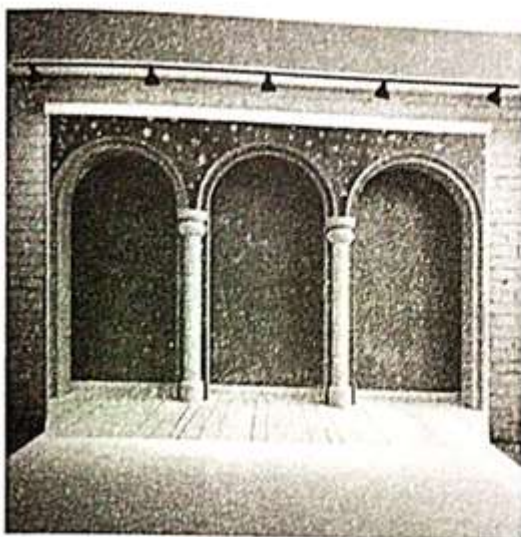
CHAPTER 2

Polynomials

(Previous Years' Questions)

Case – Study Based

1. During a theatre drama, a backdrop of building arches was used. The shape of the curve shown below can be represented by the polynomial $p(x) = -x^2 + 2x + 8$ where x is the length (in feet) on stage level.



Based on the figure given above, answer the following questions :

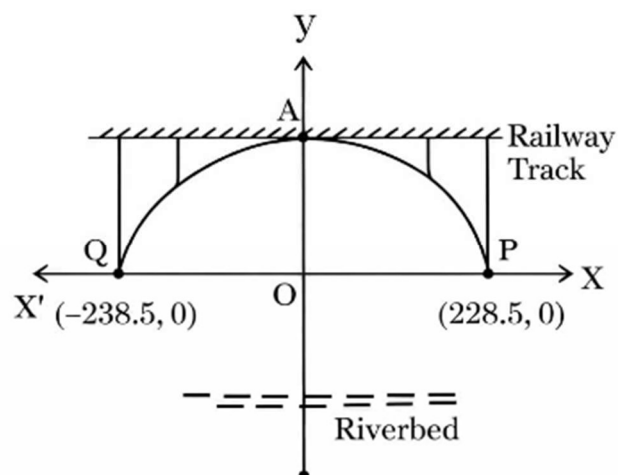
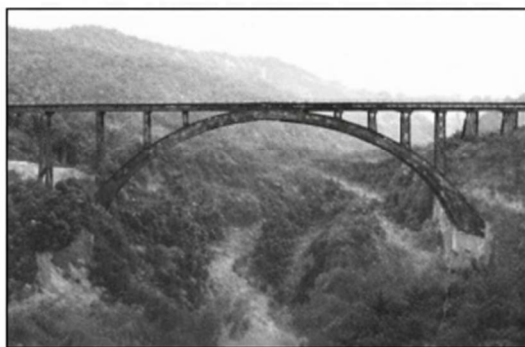
- (i) Determine the height of the arch. 1
- (ii) (a) Find zeroes of the polynomial $p(x)$. Which points on the graph represent the zeroes? 2

OR

- (ii) (b) Find the span of the arch on the stage floor. 2
- (iii) Write the coordinates of the point of intersection of the above curve with the y -axis. 1

(2026)

2.



An arch of a railway bridge, built on Chenab riverbed, is shown in the above diagram. It is a parabolic arch connecting two hills at P and Q. If the parabolic curve is represented by the polynomial $p(x) = -0.0025x^2 - 0.025x + 136$.

Observe the diagram and based on above information, answer the following questions:

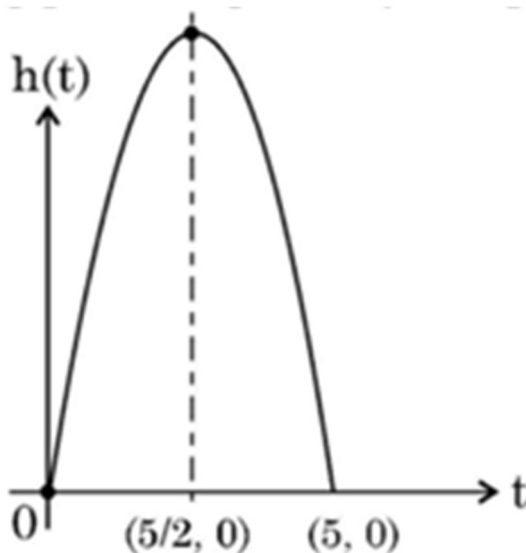
- (i) Write the co-ordinates of point A. 1
- (ii) Find the span of the arch. 1
- (iii) (a) Write the zeroes of the polynomial using diagram and verify the relationship between sum of zeroes and polynomials. 2

OR

- (iii) (b) Find the values of $p(x)$ at $x = 100$ and $x = -100$. Are they same? 2

(2026)

3. A ball is thrown in the air so that t seconds after it is thrown, its height h metre above its starting point is given by the polynomial $h = 25t - 5t^2$.



Observe the graph of the polynomial and answer the following questions:

- (i) Write zeroes of the given polynomial. 1
- (ii) Find the maximum height achieved by ball. 1
- (iii) (a) After throwing upward, how much time did the ball take to reach to the height of 30 m? 2

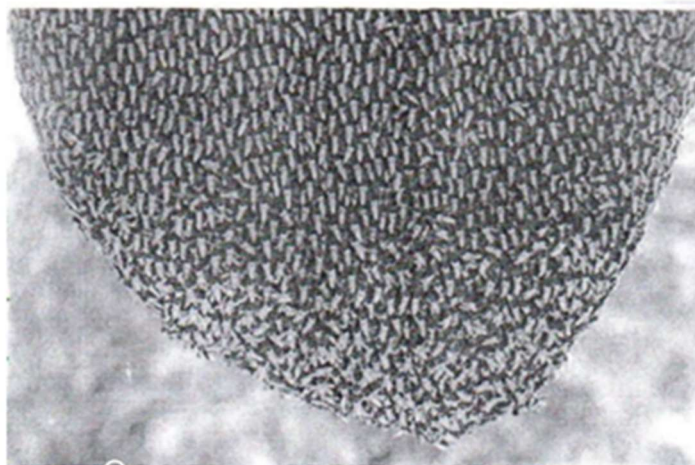
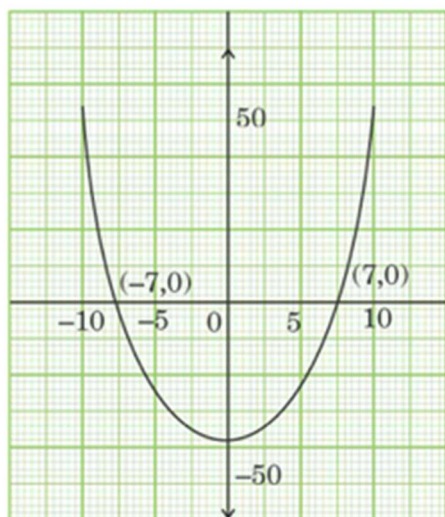
OR

- (iii) (b) Find the two different values of t when the height of the ball was 20 m. 2

(2024)

4. While playing in a garden, Samaira saw a honeycomb and asked her mother what is that. Her mother replied that it's a honeycomb made by honey bees to store

honey. Also, she told her that the shape of the honeycomb formed is a mathematical structure. The mathematical representation of the honeycomb is shown in the graph.



Based on the above information, answer the following questions:

- (i) How many zeroes are there for the polynomial represented by the graph given ? 1
- (ii) Write the zeroes of the polynomial. 1
- (iii) (a) If the zeroes of a polynomial $x^2 + (a + 1)x + b$ are 2 and -3 , then determine the values of a and b . 2

OR

- (iii) (b) If the square of difference of the zeroes of the polynomial $x^2 + px + 45$ is 144, then find the value of p . 2

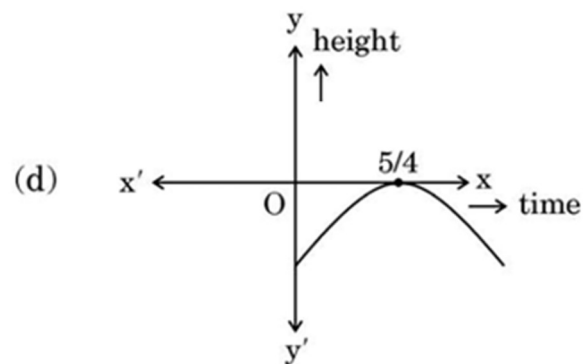
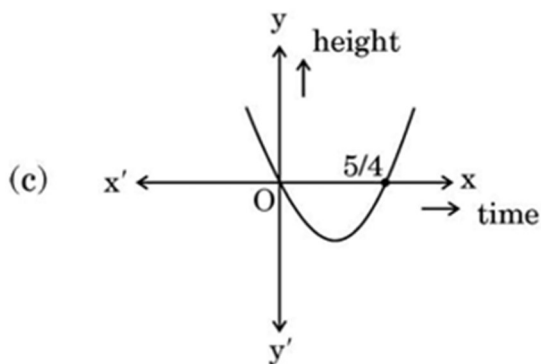
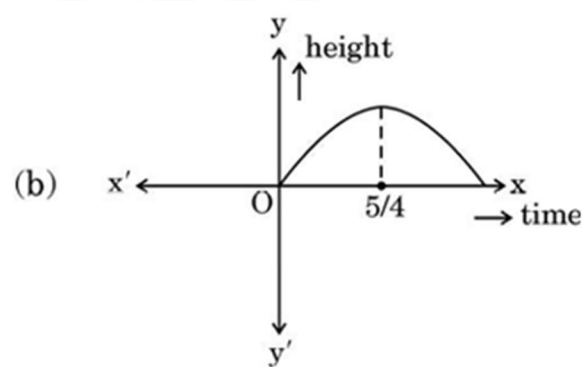
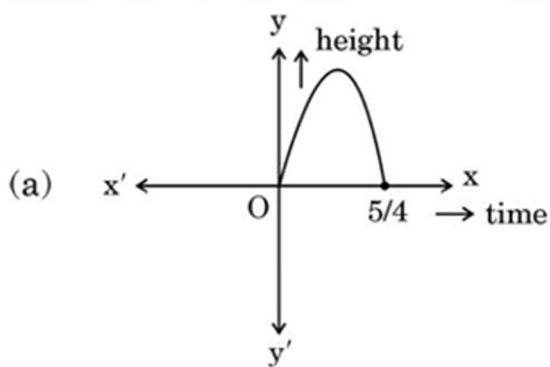
(Comptt., 2024)

5. In a pool at an aquarium, a dolphin jumps out of the water travelling at 20 cm per second. Its height above water level after t seconds is given by $h = 20t - 16t^2$



Based on the above, answer the following questions:

- (i) Find zeroes of polynomial $p(t) = 20t - 16t^2$. 1
- (ii) Which of the following types of graph represents $p(t)$? 1



(iii) (a) What would be the value of h at $t = \frac{3}{2}$?

Interpret the result.

2

OR

(iii) (b) How much distance has the dolphin covered before hitting the water level again?

2

(2023)

EDU सारथी

