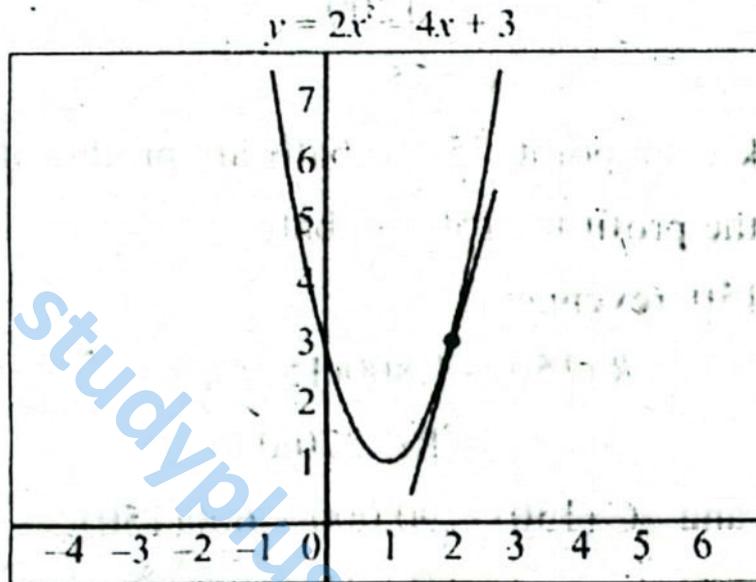




Exercise 10.2

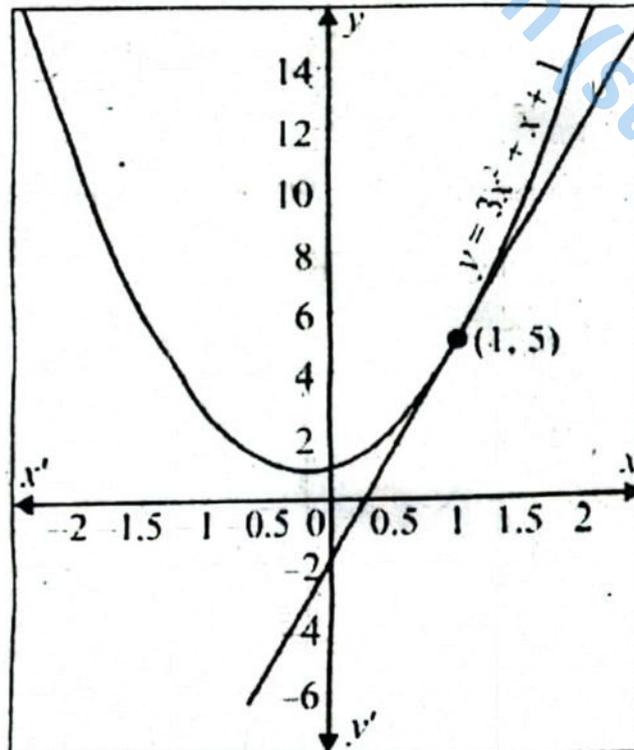


1. Plot the graph of $y = 2x^2 - 4x + 3$ from -1 to 3 . Draw tangent at $(2, 3)$ and find the gradient.



Gradient = 4

2. Plot the graph of $y = 3x^2 + x + 1$ and draw tangent at $(1, 5)$. Also find gradient of the tangent line at this point.

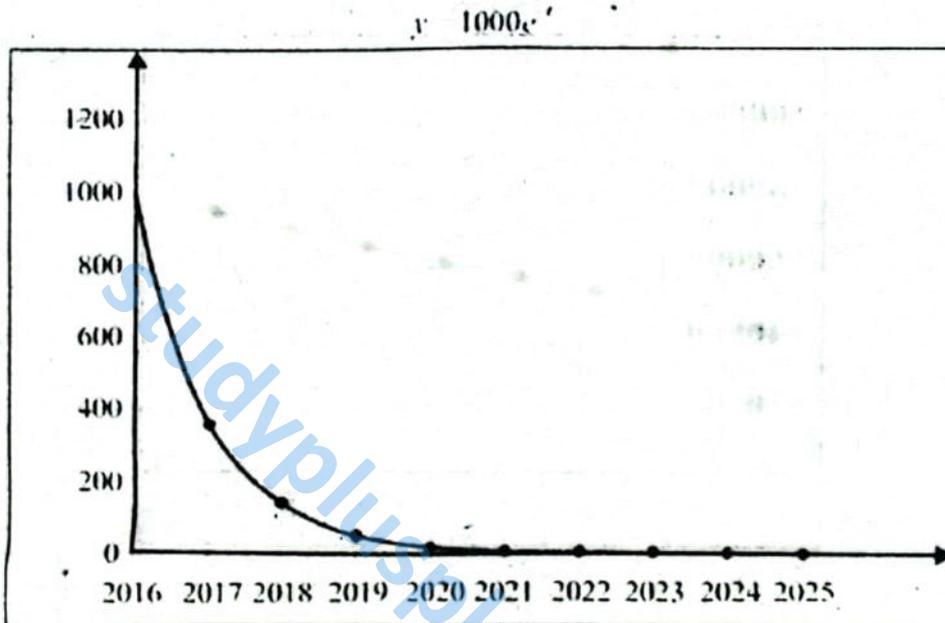


Gradient = 7



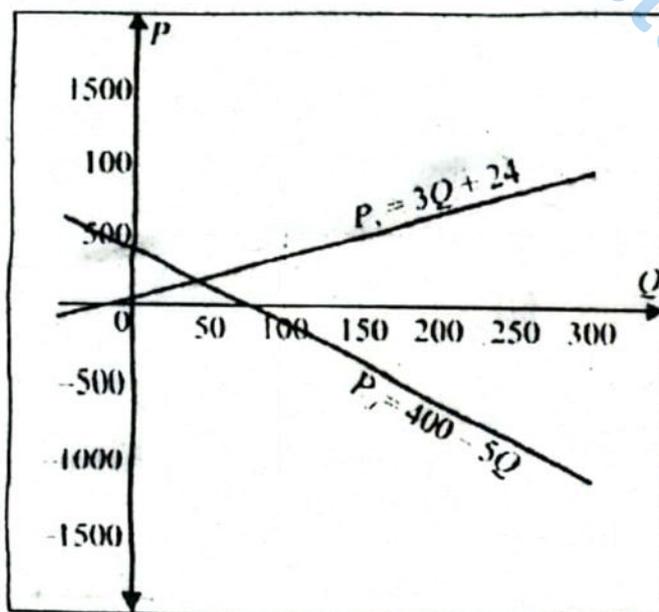
3. The strength of students in a school was 1000 in 2016. If the strength decay according to the equation $S = 1000 e^{-t}$, where S is the number of students at time t .

- (a) Graph the given equation for $t = 0$ (in 2016) to $t = 9$ (in 2025).
 (b) From the graph, estimate the student's strength in 2019 and in 2023.



4. The demand and supply functions for a product are given by the equations $P_d = 400 - 5Q$, $P_s = 3Q + 24$:

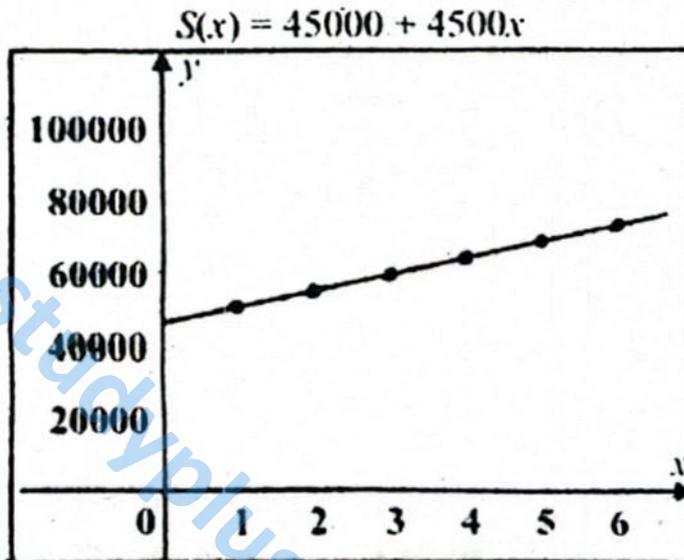
Plot the graph of each function over the interval $Q = 0$ to $Q = 300$.



5. **Shahid's salary $S(x)$ in rupees is based on the following formula:**

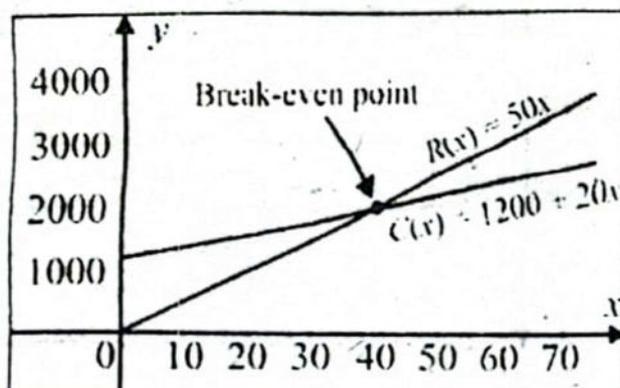
$$S(x) = 45000 + 4500x,$$

where x is the number of years he has been with the company. Sketch and interpret the graph of salary function for $0 \leq x \leq 5$.

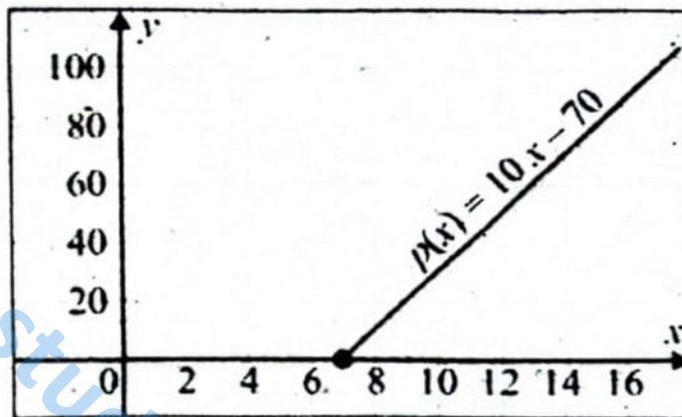


6. **A company manufactures school bags. The cost function of producing x bags is $C(x) = 1200 + 20x$ and the revenue from selling x bags is $R(x) = 50x$.**

- Find the break-even point.
- Determine the profit or loss when 250 bags are sold.
- Plot the graphs of both the functions and identify the break-even point.

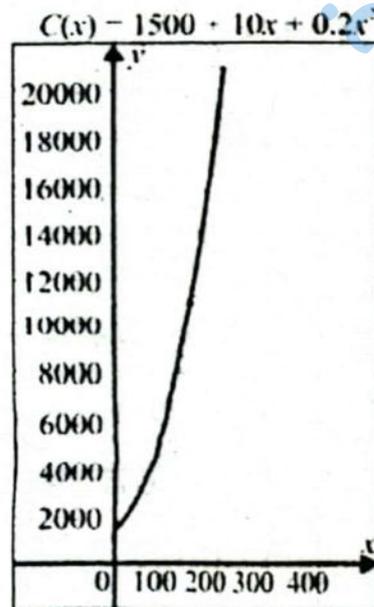


7. A newspaper agency fixed cost of Rs. 70 per edition and marginal printing and distribution costs of Rs. 40 per copy. Profit function is $p(x) = 10x - 70$, where x is the number of newspapers. Plot the graph and find profit for 500 newspapers.



Profit for 500 newspapers = Rs. 4930

8. Ali manufactures expensive shirts for sale to a school. Its cost (in rupees) for x shirts is $C(x) = 1500 + 10x + 0.2x^2$, $0 \leq x \leq 150$. Plot the graph and find the cost of 200 shirts.



Cost of 200 shirts = Rs. 11500