MAC 2233 Embedded Questions

1. What is the slope of the line $4x + 7y = 9$?

(*A*) $\frac{7}{4}$

(*B*) $-\frac{7}{4}$

(*C*) $\frac{4}{7}$

(*D*) $-\frac{4}{7}$

(*E*) none of these

2. Let $f(t) = t^4 - 3t^2 + 6t + 6$. Find $f'(t)$.

(*A*) $4t^3 - 6t + 12$

(*B*) $4t^3 - 6t + 6$

(*C*) $12t^2 - 6$

(*D*) $12t^2 - 12$

(*E*) none of these

3. Find $\lim_{x \to 3} \frac{x^2 - 5x + 6}{x - 3}$

(*A*) -1

(*B*) 1

(*C*) 5

(*D*) no limit

(*E*) none of these

4. Differentiate the function $y = \frac{x-1}{x+1}$.

(*A*) $\frac{2}{(x+1)^2}$

(*B*) $-\frac{2}{(x+1)^2}$

(*C*) $\frac{2}{(x-1)^2}$

(*D*) $-\frac{2}{(x-1)^2}$

(*E*) none of these

5. Find the relative maximum and relative minimum of $f(x) = x^3 + 6x^2 + 9x$.

(*The student is to give a written response.*)

6. Given $x^2 + x^2y + y^2 = 3$. Find $\frac{dy}{dx}$ by using implicit differentiation.

(*A*) $-\frac{2x + 2xy}{x^2 + 2y}$

(*B*) $\frac{2x + 2xy}{x^2 + 2y}$

(*C*) $-\frac{x^2 + 2y}{2x + 2xy}$

(*D*) $\frac{x^2 + 2y}{2x + 2xy}$

(*E*) none of these

7. Let $f(t)$ be the temperature of a cup of coffee t minutes after it has been poured. Suppose that $f(4) = 120$ and $f'(4) = -5$. Estimate the temperature of the coffee after 4 minutes and 30 seconds.

(*The student is to give a written response.*)

8. The rate of growth of a certain cell culture is proportional to its size. In ten hours a population of one million cells grew to seven million. When will the number of cells be eighteen million?

(*The student is to give a written response.*)