Assignment 7

The due date for submitting this assignment has passed.

Due on 2023-03-10, 23:59 IST.

As per our records you have not submitted this assignment.

In questions 1 to 5, let \( f(x) = (7 + x)(11 - 3x)^2 \).

1) The critical points of \( f(x) \) are 1 point
   - Only 
   - 1/15 only  
   - 1 and 1/15  
   - Neither 1 nor 1/15  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: 1 and 1/15

2) At \( x = 1 \), the function \( f(x) \) has 3 point
   - A local maximum but not an absolute maximum  
   - A local maximum and an absolute maximum  
   - No local maximum and an absolute maximum  
   - Neither local maximum nor absolute maximum  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: A local maximum and an absolute maximum

3) The function \( f(x) \) has 1 point
   - Maximum value of 16 and no minimum value  
   - Minimum value of 0 and no maximum value  
   - Maximum value of 16 and minimum value of 0  
   - Neither a maximum value nor a minimum value  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: Maximum value of 16 and no minimum value

In questions 4 to 5, let \( g(x) = \frac{5x + 4}{x^2 + 1} \).

4) If \( g(x) \) has a local extremum value of \( f \) at \( x = 3 \), then 5 point
   - \( a = -6, b = -10 \)  
   - \( a = -6, b = 30 \)  
   - \( a = 6, b = -30 \)  
   - \( a = 6, b = 10 \)  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: \( a = 6, b = -10 \)

5) The function \( g(x) \) has 1 point
   - Local minima at \( x = 3 \) and \( x = 1/3 \)  
   - Local maximum at \( x = 3 \) and \( x = 1/3 \)  
   - Local minimum at \( x = 3 \) and local maximum at \( x = 1/3 \)  
   - Local maximum at \( x = 3 \) and local minimum at \( x = 1/3 \)  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: Local maximum at \( x = 3 \) and local minimum at \( x = 1/3 \)

6) An isosceles triangle has its vertex at the origin and its base parallel to the x-axis with the vertex above the x-axis on the curve \( y = 2x^2 + 3x \). What is the largest area the triangle can have? 1 point
   - \( 2\sqrt{37} \)  
   - \( 3\sqrt{2} \)  
   - \( \sqrt{51} \)  
   - \( 6\sqrt{2} \)  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: \( 6\sqrt{2} \)

7) Consider determining the intervals on which the function \( f(x) = x^2 + 3x + 4 \) is increasing and/or decreasing. Which of the following 1 point holds?
   - \( f(x) \) is increasing on \( (-\infty, -b/2a) \) and decreasing on \( (-\infty, -b/2a) \)  
   - \( f(x) \) is increasing on \( (-\infty, -b/2a) \) and decreasing on \( (-\infty, -b/2a) \)  
   - \( f(x) \) is decreasing on \( (-\infty, -b/2a) \) and decreasing on \( (-\infty, -b/2a) \)  
   - \( f(x) \) is decreasing on \( (-\infty, -b/2a) \) and decreasing on \( (-\infty, -b/2a) \)  
   No, the answer is incorrect.  Score: 0
   Accepted Answers: \( f(x) \) is increasing on \( (-\infty, -b/2a) \) and decreasing on \( (-\infty, -b/2a) \),