
MATH241 4.7, 4.9 Practice

Problem 1: Find the point on the line $y = 4x + 5$ that is closest to the origin.

Solution:

Problem 2: Find the area of the largest rectangle that can be inscribed in the ellipse

$$E : \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$$

Solution:

Problem 3: Find all functions $F(x)$ such that

(i) $F'(x) = 2 \sec^2(x) + \frac{4x^{3/2}-1}{\sqrt{x}};$

(ii) $F'(x) = \sinh(x) + \cosh^2(x) + \frac{1}{x}.$

Solution:

Problem 4: Find both the general and the specific antiderivative to

$$F'(x) = e^{2x} - \frac{7}{\sqrt{1-x^2}},$$

when $F(0) = \frac{3}{2}$.

Solution: