University of Bahrain
Department of Mathematics
MATHS101: Calculus I
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Worksheet: Optimization Problems

Students' Name: _____

1. Find the local maximum and local minimum (if any) using the second derivative test.

$$f(x) = 7 - 2x^4$$

2. Find the smallest area of a rectangle whose perimeter is 32 cm.

3. Find the point on the curve $y^2 = \frac{1}{2}x^3$ that is closest to the point $(5, 0)$

4. What is the minimum vertical distance between the curves $y = 3x^2 + 6x + 8$ and $y = 2x + 2$.

5. Find a positive number for which the sum of its reciprocal and four times its square is the smallest possible.

6. Solve the previous example, but this time, assume the function has a local minimum at $x = 4$ and a point of inflection at $x = 1$.