

Worksheet #3
Math 1100-005
04/04/06

Name: _____

1. For the following functions, find both vertical and horizontal asymptotes:

(a) $f(x) = \frac{1}{x}$

(b) $g(x) = \ln(x - 2)$

(c) $h(x) = \frac{1}{2 - e^{-x}}$

2. Find the derivative of the following functions.

(a) $f(x) = xe^x - e^{x^2+3x}$

(b) $f(x) = \ln((2x - x^3)\sqrt{x})$

(c) $f(x) = \frac{1}{x^3} + \frac{x}{e^{3x}} - \ln\left(\frac{x}{x+1}\right)$

3. Evaluate the following integrals.

(a) $\int 2x^3 - \frac{1}{x^2} dx$

(b) $\int \sqrt{x} + 5x^3 + 4 dx$

(c) $\int 2x\sqrt{3x^2 - 1} dx$

$$(d) \int \frac{x+1}{(x^2+2x-3)^2} dx$$

$$(e) \int e^{5x} dx$$

$$(f) \int \frac{1}{x-1} dx$$

(g) $\int x e^{3x^2} dx$

(h) $\int \frac{x^2}{x^3+1} dx$

4. The marginal cost of a product is modeled by $\frac{dC}{dx} = \frac{4x^2}{\sqrt{x^3+1}}$ where $C = 10$ when $x = 2$. Find the cost function.