

MATH 1520
Assignment #4
Due: Friday, April 3rd

1. (11 marks) A farmer has 4 types of animals, so he wants to build a rectangular pen with 3 parallel partitions, but he can only afford 500 ft of fence. What are the dimensions of the fence with the largest possible area?
2. (11 marks) A soft drink can is to be built to hold 20π m³ liquid. Material for the top and bottom costs \$10/m² and material for the sides costs \$8/m². How can we build this can with the least possible cost?

3. (8 marks) Evaluate the following BY INTERPRETING IT AS AN AREA:

a) $\int_{-1}^5 (3-x)dx$

b) $\int_0^3 (-\sqrt{9-x^2})dx$

4. (45 marks) Evaluate the following:

a) $\int (x^2 + 1)(x + 1)dx$

b) $\int (7^{2t} - (7t)^2)dt$

c) $\int \frac{\sqrt{r} + 2r - 1}{r} dr$

d) $\int \ln(e^{u^2+e^u+3})du$

- e) If the acceleration of a particle is given by the function $a(t) = 20t^3 + 12t^2 + 6t + 10$. Find the particles position after 1 minute if $s(0) = 0$ and $v(0) = 1$.

f) $\int_x^1 t^3 e^{4t+1} dt$

g) $\int_7^{x^3+x} \sqrt[3]{t^2 + \log_2 t} dt$

h) $\int_{-1}^5 (3-x)dx$ (HINT: see part 3 a))

- i) The area bounded between the function $f(x) = e^x - 1$ and the x - axis from $x = -1$ to $x = 1$.

