

Math 241: HW 13

Due on Wednesday, October 30

Fall '13

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Problem 1

Compute the following:

$$a) \quad \int 7x^4 + 10x^\pi + x(x^{7/2}) + 10 \, dx$$

$$b) \quad \int \frac{x^3 + 10}{x^2} \, dx$$

$$c) \quad \int \frac{10 + \frac{1}{x}}{x^{15}} \, dx$$

Problem 2

Use U -Substitution to compute the following

$$a) \quad \int (\sqrt{x^5 + 10})x^4 \, dx$$

$$b) \quad \int \frac{\sqrt[3]{x+10} + 10}{(x+10)^{2/3}} \, dx$$

For the next two problems, use U-sub AND the trick from the computer lab last Wednesday.

$$c) \quad \int \frac{x-1}{(x-2)^{15}} \, dx$$

$$d) \quad \int (x-1)(x-3)^{100} \, dx$$

Problem 3

Suppose we are falling off of a cliff. Our handy wristwatch speedometer has given us a velocity function of $v(t) = -32t$ (in feet per second) and the initial condition, $p(0) = 500ft$. Find $p(t)$. Presumably, when $p(t) = 0$, we hit the ground. At what time t does this happen?

Problem 4

Compute the following:

$$a) \quad \int \cos^2(\theta) \, d\theta$$

$$b) \quad \int \cot^2(x) \, dx$$

$$c) \quad \int x^4 \sin^2(x^5 + 2) \, dx$$

hint: Use U-sub AND the technique used in part a).