Quiz 1, Calculus 2

Dr. Graham-Squire, Spring 2012

Name: Key

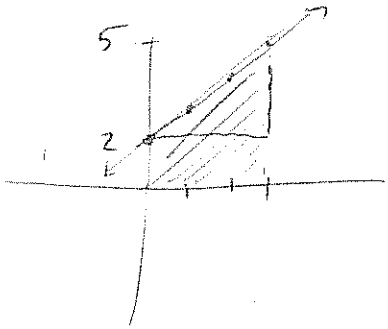
1. (4 points) Use antiderivatives to evaluate the definite integral $\int_0^1 x^{2/5}\,dx$.

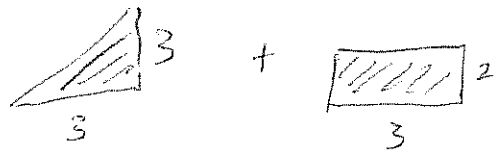
$$= \frac{5}{7}x^{7/5}\Big|_0^1$$

$$= \frac{5}{7}(1)^{7/5} - \frac{5}{7}(0)^{7/5}$$

$$= \boxed{\frac{5}{7}}$$

2. (3 points) Use formulas from geometry to find $\int_0^3 (x+2)\,dx$.





$$= \frac{1}{2}\cdot 3\cdot 3 + 2\cdot 3$$

$$= 4.5 + 6$$

$$= \boxed{10.5}$$

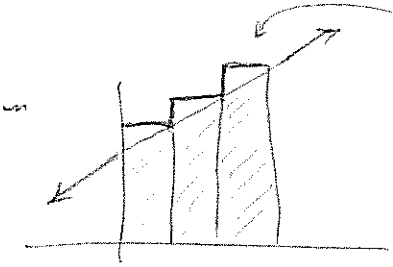
3. (3 points) (a) Approximate $\int_0^3 (x+2)\,dx$ by calculating R_3 (that is, the Riemann sum using right endpoints with 3 subintervals).
(b) Compare your answer to question (2); that is, explain how your approximation is different from the actual value (if it is). A sketch of the approximation may help.

(a) $\int_0^3 (x+2) \approx 1\left(f(1)+f(2)+f(3)\right)$

$= 1(3+4+5) = \boxed{12}$

(b) Question 2 is the exact answer, part (a) is an overestimate because the function is increasing.

Diagram



The rectangle are part (a), they are an overestimate.