

## Calculus II (157–01)

### Second Exam

Spring 2016

Please do all work on this paper. Points are written to the left of each problem.

**No calculators are allowed and no cell phones are allowed.**

64 pts 1. Evaluate the following integrals, if possible. If not possible, say so and why.

(a)  $\int_0^{1/\sqrt{3}} \sqrt{4 - 9x^2} dx$

/32

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

(c)  $\int \sec^4 t \, dt$

(d)  $\int_1^4 \frac{1}{(x-2)^2} \, dx$

/42

10 pts 2. Assume that the curve  $C$  has a parametric representation as  $x(t) = t^3 - 3t$  and  $y(t) = \ln(2t)$  with  $t > 0$ . Find a cartesian equation for  $C$ .

10 pts 3. Assume that the function  $f$  is decreasing on the interval  $[1, 3]$  and  $[1, 3]$  has been divided into 5 equal parts. Assume also that the left approximation to  $\int_1^3 f(x) dx$  is  $L_5 = 3.2$  and the right approximation to  $\int_1^3 f(x) dx$  is  $R_5 = 2.4$ .

(a) Find the the trapezoidal approximation  $T_5$  to  $\int_1^3 f(x) dx$ .

(b) What do you know about the value of  $\int_1^3 f(x) dx$ .

16 pts 4. Assume that the curve  $C$  has a parametric representation as  $x(t) = 1 + 3t^2$  and  $y(t) = 4 + 2t^3$  with  $0 \leq t \leq 1$ . Find the length of  $C$ .

/26