

Name:

ID:

Discussion Section:

This exam consists of 16 questions:

- 14 multiple choice questions worth 5 points each
- 2 hand-graded questions worth a total of 30 points.

INSTRUCTIONS: Read each problem carefully and answer the question as written. You may use a non-graphing calculator and a standard sized (no larger than 4×6) index card worth of notes for the exam, but you may use no other aids. Record your answer to the multiple choice questions on the accompanying answer card. Show your work on the written problems and write clearly – the ease with which your answer can be read will be a factor in your grade.

1. Suppose $f(x)$ is a function so that $f'(x) = x + \frac{2}{x}$ and $f(1) = 2$. What is $f(2)$? (Give the closest answer.)

- (a) 1.886
- (b) 2.000
- (c) 2.079
- (d) 3.079
- (e) 3.125
- (f) 4.375
- (g) 4.500
- (h) 4.667
- (i) 4.886
- (j) 5.000

2. A very large vat contains 5,000 gallons of beer at 1:00 PM on a certain day. At that time, it springs a leak and leaks beer at a rate of $600 - 50t$ gallons/hr until 6:00 PM (5 hours later), where t represents hours after 1:00 PM. How many gallons of beer **remain** in the tank at 6:00 PM? (Choose the nearest answer.)

- (a) 2,000 gallons
- (b) 2,250 gallons
- (c) 2,375 gallons
- (d) 2,500 gallons
- (e) 2,625 gallons
- (f) 2,750 gallons
- (g) 2,875 gallons
- (h) 3,000 gallons
- (i) 3,250 gallons
- (j) 4,000 gallons

3. Find $\int_0^\pi (\cos x)^2 \sin x \, dx$

(a) $-\frac{\pi^3}{3}$

(b) -1

(c) $-\frac{2}{3}$

(d) $-\frac{1}{3}$

(e) 0

(f) $\frac{1}{3}$

(g) $\frac{2}{3}$

(h) 1

(i) $\frac{\pi^3}{3}$