

## MAT 126 Spring 2006 Midterm I—Answers

1. (a)  $R_4 = 15.4$ , an underestimate.

(b)  $L_4 = 25$ , an overestimate.

2.  $A = \pi - 4$ .

3. (a) 2

(b) 8

4.

$$\int_1^6 \frac{\cos^4 x}{1+x^3} dx$$

5. (a) (i) (5 points)

$$\int \frac{\sin^3 x}{1 - \cos^2 x} dx = -\cos x + C$$

(ii) (5 points)

$$\int (1 - 2t)(1 + 2t) dt = t - \frac{4t^3}{3} + C$$

(b) (i)

$$\int_1^4 \frac{3 + u^3}{u^4} du = \frac{63}{64} + 2 \ln 2$$

(ii)

$$\int_1^1 x^2 \sin^{10} x dx = 0$$

(iii)

$$\int_1^8 \frac{x-1}{\sqrt[3]{x^2}} dx = 8.25$$

6.

$$A = 1 - \frac{\sqrt{2}}{2}$$