

MA17300 Midterm Exam 1

Practice Test 2

Use the substitution formula to evaluate the integral.

$$1) \int_{\pi}^{3\pi/2} \frac{\sin \theta \, d\theta}{2 + \cos \theta}$$

Evaluate the integral by using multiple substitutions.

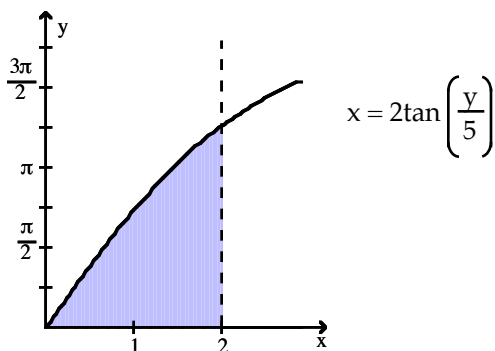
$$2) \int \frac{12 \tan^2 x \sec^2 x}{(2 + \tan^3 x)^2} \, dx$$

Find the area enclosed by the given curves.

$$3) y = 2x - x^2, \quad y = 2x - 4$$

Find the volume of the solid generated by revolving the shaded region about the given axis.

4) About the y-axis



Use the shell method to find the volume of the solid generated by revolving the region bounded by the given curves about the given lines.

$$5) y = 16 - x^2, \quad y = 16, \quad x = 4; \text{ revolve about the line } y = 16$$

Find the length of the curve.

$$6) y = \frac{3}{8}(x^{4/3} - 2x^{2/3}) \text{ from } x = 1 \text{ to } x = 64$$

Solve the problem.

- 7) At lift-off, a rocket weighs 40.6 tons, including the weight of fuel. It is fired vertically, and the fuel is consumed at the rate of 2.53 tons per 1,000 ft of ascent. How much work is done in lifting the rocket to an altitude of 10,000 ft?

Answer Key

Testname: ME1PRAC2

1) $-\ln 2$

2) $\frac{-4}{2 + \tan^3 x} + C$

3) $\frac{32}{3}$

4) $10\pi^2 - 20\pi$

5) $\frac{1024}{5}\pi$

6) $\frac{855}{8}$

7) $2.80 \times 10^5 \text{ ft}\cdot\text{ton}$