

MA17300 Midterm Exam 2

Practice Test 1

Solve the problem.

- 1) The barometric pressure p at an altitude of h miles above sea level satisfies the differential equation

$$\frac{dp}{dh} = -0.2 p. \text{ If the pressure at sea level is 29.92 inches of mercury, find the barometric pressure at 18,000 ft.}$$

Evaluate the integral.

$$2) \int_1^9 14 \frac{\sinh \sqrt{x}}{\sqrt{x}} dx$$

$$3) \int_0^3 x^4 \ln 6x dx$$

$$4) \int 9 \sec^4 x dx$$

Integrate the function by using a trigonometric substitution.

$$5) \int \frac{1}{t^2 \sqrt{4-t^2}} dt$$

Express the integrand as a sum of partial fractions and evaluate the integral.

$$6) \int \frac{3x^2 - 27x + 30}{x^3 - 8x^2 + 15x} dx$$

Evaluate the improper integral or state that it is divergent.

$$7) \int_{-\infty}^{\infty} 10xe^{-x} dx$$

Answer Key

Testname: ME2PRAC1

1) 15.13 in.

$$2) 14 \left(e^3 + e^{-3} - e - \frac{1}{e} \right)$$

3) 130.75

$$4) 9 \tan x + 3 \tan^3 x + C$$

$$5) -\frac{\sqrt{4-t^2}}{4t} + C$$

$$6) 2 \ln|x| - 3 \ln|x-5| + 4 \ln|x-3| + C$$

7) Divergent