

MA17300 Midterm Exam 2

Practice Test 2

Solve the problem.

- 1) The charcoal from a tree killed in a volcanic eruption contained 64.9% of the carbon-14 found in living matter. How old is the tree, to the nearest year? Use 5700 years for the half-life of carbon-14.

Evaluate the integral by using integration by parts.

2) $\int y^2 \sin 4y \, dy$

Evaluate the integral.

3) $\int_0^{\pi/2} \cos^2 3x \sin^3 3x \, dx$

Integrate the function by using a trigonometric substitution.

4) $\int \frac{\sqrt{x^2+9}}{5x^2} \, dx$

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

5) $\int_0^1 \frac{x^3}{x^2+6x+9} \, dx$ (Perform a long division first)

Evaluate the improper integral or state that it is divergent.

6) $\int_0^{\infty} \frac{25(1+\tan^{-1}x)}{1+x^2} \, dx$

Find the limit of the sequence if it converges; otherwise indicate divergence.

7) $a_n = \ln(9n+5) - \ln(4n+9)$

Answer Key

Testname: ME2PRAC2

1) 3555 years

$$2) -\frac{1}{4}y^2 \cos 4y + \frac{1}{8}y \sin 4y + \frac{1}{32} \cos 4y + C$$

$$3) \frac{2}{45}$$

$$4) \frac{1}{5} \ln \left| \sqrt{x^2+9} + x \right| - \frac{\sqrt{x^2+9}}{5x} + C$$

$$5) 27 \ln \left(\frac{4}{3} \right) - \frac{31}{4}$$

$$6) \frac{25}{2} \pi \left(1 + \frac{\pi}{4} \right)$$

$$7) \ln \left(\frac{9}{4} \right)$$