

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 7

MATHEMATICS 1001

FALL 2019

Due: Friday, November 15th, 2019 at 4:00pm. SHOW ALL WORK.

Note: You are encouraged to complete the WebAssign problem sets “Indefinite Integrals by Partial Fractions”, “Definite Integrals by Partial Fractions”, “Indefinite Trigonometric Integrals” and “Definite Trigonometric Integrals” before you work on this assignment.

1. Use a partial fraction decomposition to evaluate each of the following.

(a) $\int \frac{2x + 3}{x^3 - 3x^2 + 4x - 12} dx$

(b) $\int \frac{5x^4 + 32x - 32}{x^5 - 4x^4 + 4x^3} dx$

(c) $\int \frac{4x^4 - 8x^3 - 21x^2}{4x^2 - 1} dx$

(d) $\int \frac{3x^4 + 4x^3 + 6x^2 + 3}{(x^2 + 1)^3} dx$

2. Evaluate each of the following trigonometric integrals.

(a) $\int \frac{\sin^7(x)}{\sqrt{\cos(x)}} dx$

(b) $\int \cos^4(3x) dx$

(c) $\int \frac{\sin^4(x)}{\cos^4(x)} dx$

(d) $\int \frac{\cot^3(\sqrt{x}) \csc^9(\sqrt{x})}{\sqrt{x}} dx$