

CPSC 031 — Mathematics Review for CPSC 413

Exercise #3 — Integration

September, 2000

These questions can be answered using the integration rules learned in MATH 249 or 251 and, possibly, integration by parts and integration by substitution (which may have been covered in MATH 253, instead).

Note: It should *not* be necessary to use either “integration by parts” or “integration by substitution” to answer questions on quizzes in CPSC 413: The integration rules you learned in MATH 249 or 251 will be sufficient!

Compute each of the following integrals, assuming a and b are positive real numbers such that $b > a > 1$.

1. $\int_a^b x^2 dx$

2. $\int_a^b x^\pi dx$

3. $\int_a^b 4x^3 + \frac{1}{x^4} dx$

4. $\int_a^b (2 - \sqrt{x}) dx$

5. $\int_a^b e^x dx$

6. $\int_a^b x + \frac{1}{x} dx$

7. $\int_a^b \frac{1}{x-1} dx$

8. $\int_a^b \frac{(\ln x)^3}{x} dx$

9. $\int_a^b x \ln x dx$

10. $\int_a^b x^2 e^x dx$