MA 138 Worksheet #3

Section 7.1
1/16/24

1 Evaluate the indefinite integral: $\displaystyle\int \frac{3x-3}{(3x^2-6x+4)^5}\,dx.$

2 Evaluate the indefinite integral: $\displaystyle\int x^3\sqrt{x^2+5}\,dx.$

3 Evaluate the indefinite integral $\displaystyle\int \frac{2ax+b}{ax^2+bx+c}\,dx,$ where $a, b,$ and c are all constants.

4 Evaluate the indefinite integral $\displaystyle\int g'(x)e^{-g(x)}\,dx,$ where $g(x)$ is a continuous function whose derivative $g'(x)$ is also continuous.

5 Evaluate the definite integral: $\displaystyle\int_0^2 \frac{x}{x+2}\,dx.$

6 Consider the definite integral $\displaystyle\int_{\pi/3}^{\pi/2} \frac{\cos(z)}{\sin^2(z)}\,dz.$

(a) What is the most appropriate substitution to use to simplify this integral?

(b) Using the substitution from part (a), $du = f(z)dz$ where $f(z)$ is what?

(c) After making the substitution and simplifying we obtain the integral $\displaystyle\int_a^b g(u)du.$ What are the following?

i. $g(u) =$

ii. $a =$

iii. $b =$