

**MATH 253**  
**Handout # 1T**

**A**

1. For  $x > 0$  find  $\int \sqrt{x} \left( \frac{5}{\sqrt{x}} - \frac{4}{x^{\frac{3}{2}}} \right) dx$ .

2. Evaluate  $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{\cos^3 x}{\sin^3 x} dx$ .

3. Find the inverse function  $f^{-1}$  and its range and domain if  $f(x) = e^{\sqrt{4-x}}$ .

**B**

4. For  $x \neq 0$  find  $\int \frac{5x - \sqrt[3]{x} + 3}{\sqrt[3]{x}} dx$ .

5. Evaluate  $\int_0^2 \frac{x^2}{3-x} dx$ .

6. Find the inverse function  $f^{-1}$  and its range and domain if  $f(x) = \ln \frac{1}{1-x}$ .

**C**

7. For  $x > 0$  find  $\int \left( 2\sqrt{x} - \frac{1}{x} \right)^2 dx$ .

8. Evaluate  $\int_{\frac{1}{2}}^1 \frac{3^{\frac{1}{x}}}{x^2} dx$ .

9. Find the inverse function  $f^{-1}$  and its range and domain if  $f(x) = \frac{1-2x}{x+3}$ .

**D**

10. Find  $\int x \cos(3x^2 + 1) dx$ .

11. Evaluate  $\int_e^{e^3} \frac{1}{x \ln x} dx$ .

12. Find the inverse function  $f^{-1}$  and its range and domain if  $f(x) = -\sqrt{1+x}$ .