

### MATH 1710 Tutorial 10

In problems 1–4, evaluate indefinite integrals of the functions in problems 7–10 of Tutorial 9.

In problems 5–9, evaluate the integrals.

5.  $\int \frac{x^2 + 2x}{x^3 + 3x^2 + 2} dx$

6.  $\int \frac{1}{x^3 + 27} dx$

7.  $\int \frac{x + 1}{(x - 1)^3(x^2 + 1)} dx$

8.  $\int \frac{x^2 + 2}{4x^5 + 4x^3 + x} dx$

9.  $\int_0^2 \frac{x^2}{(x^2 + 4)^3} dx$

#### Answers

1.  $\frac{1}{2} \ln|x| + \frac{1}{10} \ln|2x - 1| - \frac{1}{10} \ln|x + 2| + C$

2.  $\frac{x^2}{2} + x + \ln|x - 1| - \frac{2}{x - 1} - \ln|x + 1| + C$

3.  $\ln|x| + \frac{1}{2} \ln(x^2 + 4) - \frac{1}{2} \text{Tan}^{-1}\left(\frac{x}{2}\right) + C$

4.  $\ln|x| - \frac{1}{2} \ln(x^2 + 1) - \text{Tan}^{-1}x - \frac{1}{2(x^2 + 1)} + C$

5.  $\frac{1}{3} \ln|x^3 + 3x^2 + 2| + C$

6.  $\frac{1}{27} \ln|x + 3| - \frac{1}{54} \ln(x^2 - 3x + 9) + \frac{1}{9\sqrt{3}} \text{Tan}^{-1}\left(\frac{2x - 3}{3\sqrt{3}}\right) + C$

7.  $\frac{1}{2(x - 1)} - \frac{1}{2(x - 1)^2} + \frac{1}{2} \text{Tan}^{-1}x + C$

8.  $2 \ln|x| - \ln(2x^2 + 1) + \frac{3}{4(2x^2 + 1)} + C$

9.  $\frac{\pi}{256}$