

BC Calculus Integration Bee Qualifier

Answers should be in simplest form i.e. simplify fractions and expressions down to a single number. If an integral does not converge, put DNE. $\lfloor x \rfloor$ is to be interpreted as the greatest integer less than or equal to x . Don't forget the $+C$!

1.

$$\int_{69}^{420} x \, dn$$

9.

$$\int_{-\infty}^{\infty} \arctan(x) \, dx$$

2.

$$\int_0^{\infty} e^{-ax} \, dx$$

10.

$$\int \ln(x) \, dx$$

3.

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

11.

$$\int \frac{1}{3 + 25x^2} \, dx$$

4.

$$\int_0^2 x^3 - 3x^2 + 3x - 1 \, dx$$

12.

$$\int_{-27}^{81} \frac{1}{x^2 - 7x + 12} \, dx$$

5.

$$\int_0^{\frac{\pi}{4}} \tan\left(\frac{\pi}{4} - x\right) \, dx$$

13.

$$\int_0^5 \lfloor x \rfloor \, dx$$

6.

$$\int_{-6}^{-6} \sqrt{36 - x^2} \, dx$$

14.

$$\int \frac{\arcsin(x)}{\sqrt{1 - x^2}} \, dx$$

7.

$$\int \frac{1}{x^2 + 100} \, dx$$

15.

$$\int \frac{3x^2 - 10x + 2}{x^3 - 5x^2 + 2x - 6} \, dx$$

8.

$$\int \csc(x) \, dx$$

16.

$$\int_0^{\frac{\pi}{2}} \frac{1}{1 + \tan(x)} \, dx$$