

NCEA Level 3 Calculus (Integration)

17. The Fundamental Theorem of Calculus (Homework)

Reading

This is an explanation with visualisations of why the FTC is true (but is not a proof); it follows the same kind of reasoning that I use in the calculus notes: <https://www.youtube.com/watch?v=FnJqaIESC2s>.

Questions

1. Evaluate

$$\int_0^{\frac{\pi}{4}} \sec^2 \theta \, d\theta$$

2. If $\int_1^3 f(x) \, dx = 7$ and $\int_2^3 f(x) \, dx = -3$, what is the value of $\int_1^2 f(x) \, dx$?
3. Find the area enclosed between the graphs of $3y = x^2$ and $y = 2x$.