MATA36 TUTORIAL 13 - WEEK 5

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Problem 1. Calculate the volume of the region obtained by rotating the following curves around the x-axis with.

(1) $\sqrt{x}, 0 \leq x \leq 5$

(2) $\sqrt{\dfrac{x}{\sqrt{1-x^2}}} \quad 0 \leq x \leq 1/2$

(3) $\dfrac{1}{\sqrt{x^2+2x+1}} \quad 2 \leq x \leq 4$

Problem 2. Calculate the area bounded by $y = x + 1$ and $y = \dfrac{1}{1+e^x}, 0 \leq x \leq 1$.

Problem 3. Show that for any $a > 0$,

$$\int \frac{1}{\sqrt{x^2+a^2}}\, dx = \ln(\sqrt{x^2+a^2}+x) + C$$

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