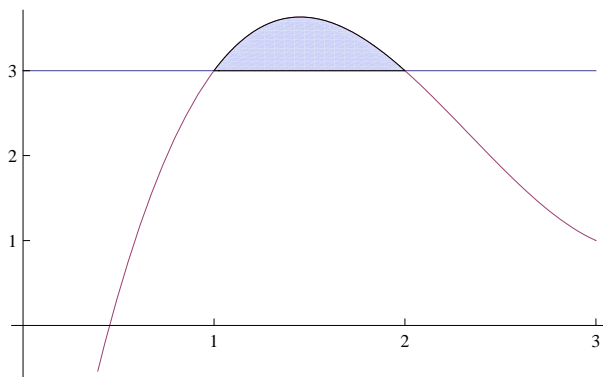


1. (6 points) Evaluate  $\int (4x + 2) \sin(2x) dx$  via integration by parts.

2. (6 points) Set up an evaluable integral whose value is the volume of the solid produced by rotating the region bounded by  $y = x^3 - 7x^2 + 14x - 5$  and  $y = 3$  around the  $y$ -axis. It is **not necessary to evaluate the integral**.



3. **(6 points)** Evaluate the trig-substitution integral  $\int \frac{x^3}{\sqrt{x^2-4}} dx$

4. **(6 points)** Using partial fraction decomposition, evaluate the integral  $\int \frac{2x+1}{x^2+6x+9} dx$ .

5. **(2 point bonus)** Evaluate the integral  $\int \frac{e^{3t}}{e^t - e^{-t}} dt$ .