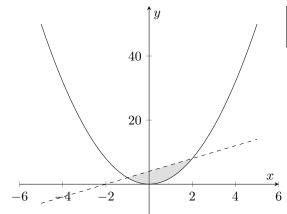
1. How big is the parabolic segment between the parabola $f(x) = 2x^2$ and the line g(x) = 4 + 2x? Sketch a graph to visualize the desired area.

Solution: The functions intersect at $P_1(-1,2)^T$ and at $P_2(2,8)^T$. Thus, the area is

$$A = \int_{-1}^{2} g(x) - f(x) dx = \int_{-1}^{2} 4 + 2x - 2x^{2} dx = \left[\frac{1}{3} x (12 + 3x - 2x^{2}) \right]_{-1}^{2} = 2(-4 + 3x^{2} - x^{3})$$



$$--- f(x) = 2x^2$$
$$--- g(x) = 4 + 2x$$