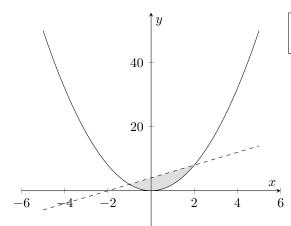
1. (k points) How big is the parabolic segment between the parabola  $f(x) = 2x^2$  and the line g(x) = 4 + 2x?

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

$$A = \int_{-1}^{2} g(x) - f(x) dx = \int_{-1}^{2} 4 + 2x - 2x^{2} dx = \left[ 4 + 2x - 2x^{2} \right]_{-1}^{2} = 9.0$$



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