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Problem 1. Consider the region bounded by  $y = x^2$ ,  $y = x + 2$ , and the  $y$ -axis (I recommend trying to draw a picture).

a) Using the  $x$ -integral ( $\int_a^b f(x)dx$ ), what is the area bounded by this region? (Set up integral only)

b) Using the  $y$ -integral ( $\int_a^b f(y)dy$ ), what is the area bounded by this region? (Set up integral only)

c) Evaluate one of the integrals from part (a) or part (b).

Problem 2. Consider the region bounded by  $y = 2x^2 - 1$ ,  $y = 2 - x^2$ , and the  $x$ -axis.

a) Using the  $x$ -integral ( $\int_a^b f(x)dx$ ), what is the area bounded by this region? (Set up integral only)

b) Using the  $y$ -integral ( $\int_a^b f(y)dy$ ), what is the area bounded by this region? (Set up integral only)

c) Evaluate one of the integrals from part (a) or part (b).

Problem 3. Consider the regions bounded by  $y = (x - 1)^3 + 1$  and  $y = x$ .

a) Using the  $x$ -integral ( $\int_a^b f(x)dx$ ), what is the area bounded by this region? (Set up integral only)

b) Using the  $y$ -integral ( $\int_a^b f(y)dy$ ), what is the area bounded by this region? (Set up integral only)

c) Evaluate both integrals.

d) Why are they different?