

Please show **all** your work! Answers without supporting work will not be given credit.
Write answers in spaces provided.

Name: _____

1. [5 pts] Set up the integral that computes the area shown to the right with respect to x .

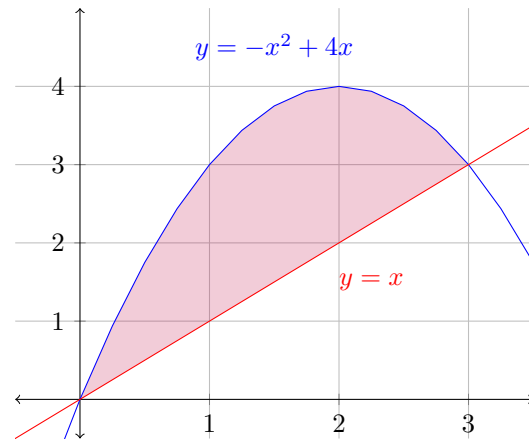
DON'T COMPUTE IT!!!

Solution: Using the graph, we can see both lines intersect at $x = 0, 3$ which will be our bounds. [1 pt].

We can also see the top function is $y = -x^2 + 4x$ and the bottom function is $y = x$. [2 pts].

Hence if we put it all together

$$\begin{aligned} \text{Area} &= \int_0^3 (-x^2 + 4x - x) \, dx && \text{[2 pts]} \\ &= \int_0^3 (-x^2 + 3x) \, dx \end{aligned}$$



2. [5 pts] Set up the integral that computes the area of the region bounded by

$$y = \sin(x), \quad y = \cos(x), \quad x = -\pi/4 \quad \text{and} \quad x = \pi/4$$

with respect to x .

DON'T COMPUTE IT!!!

Solution:

We are given the bounds for our integral

$$-\frac{\pi}{4} \leq x \leq \frac{\pi}{4} \quad [1 \text{ pt}]$$

Next we need to determine the "Top" and "Bottom" functions. From the graph on the left, we can see that $y = \cos(x)$ is the top function and $y = \sin(x)$ is the bottom function. [2 pts]

Hence if we put it all together

$$\text{Area} = \int_{-\pi/4}^{\pi/4} (\cos(x) - \sin(x)) dx \quad [2 \text{ pts}]$$