

4. Same as problem 3 except use integration with respect to y .

5. Find the area of the ellipse given by $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.

6. Find the area of the region bounded by the curves

$$\begin{aligned}\frac{x^2}{9} + \frac{y^2}{4} &= 1 \\ \frac{x^2}{4} - \frac{y^2}{9} &= 1\end{aligned}$$

To find the points of intersection multiply the first equation by 4 and the second by 9. Add the resulting equations and solve for x .

7. Find the area between the curve $y = xe^{-x}$ the positive x -axis and the line $x = T$. What happens to the area as $T \rightarrow \infty$

8. Same as number 8 and $y = xe^{-x^2}$.