Ch. 7.1b Area between Curves Area FRQ Graphing Calculator Practice Problems

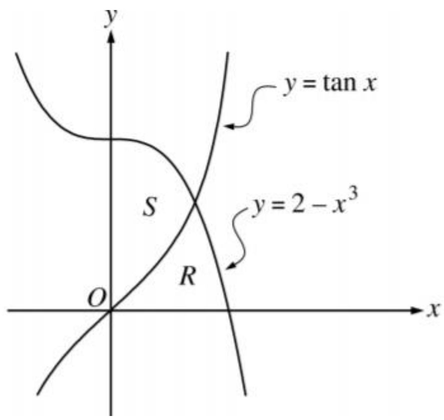
1. Let R and S be the regions in the first quadrant shown in the figure above. The region R is bounded by the x-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$. The region S is bounded by the y-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$.

$$\boldsymbol{Area} = \int_{x_1}^{x_2} (Top\ \ graph - Bottom\ graph)dx \qquad \int_{y_1}^{y_2} (Right\ graph - Left\ graph)dy$$

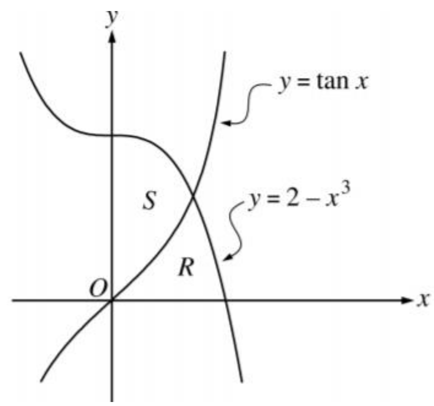
(in the forms of " y = __ ") (in the form of " x = ___ ")

a) Find the area of **S**

i) (Top – Bottom Method)

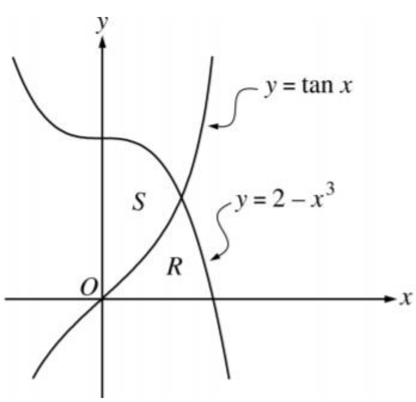


ii) (Right – Left Method)

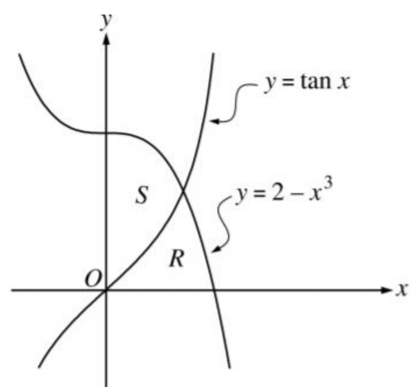


b) Find the area of **R**

i) (Top – Bottom Method)



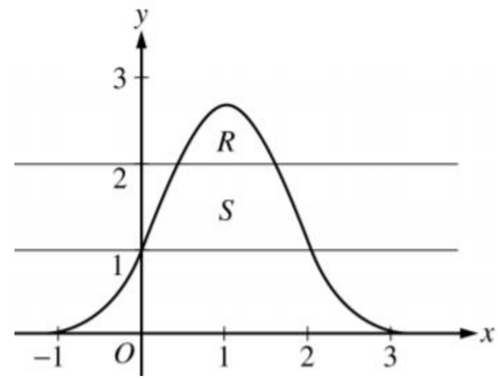
ii) (Right – Left Method)



2) Let R be the region bounded by the graph of $y = e^{2x-x^2}$ and the horizontal line $y = 2$, and let S be the region bounded by the graph of $y = e^{2x-x^2}$ and the horizontal lines $y = 1$ and $y = 2$, as shown above.

(a) Find the area of R.

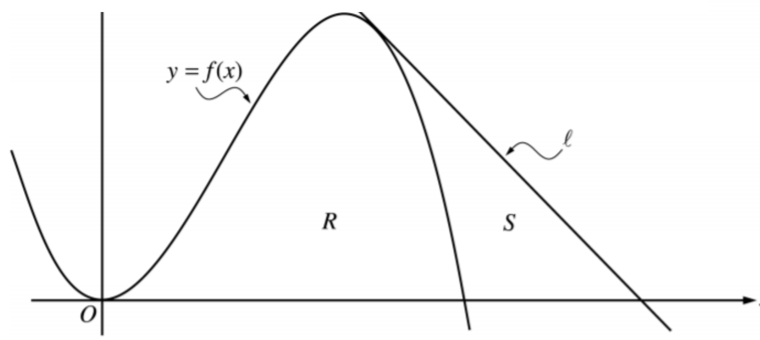
(b) Find the area of S.



3) Let f be the function given by $f(x) = 4x^2 - x^3$, and let ℓ be the line $y = 18 - 3x$, where ℓ is tangent to the graph of f. Let R be the region bounded by the graph of f and the x-axis, and let S be the region bounded by the graph of f, the line ℓ, and the x-axis, as shown above.

(a) Show that ℓ is tangent to the graph of $y = f(x)$ at the point $x = 3$.

(b) Find the area of S.



4) Let f be the function given by $f(x) = \dfrac{x^3}{4} - \dfrac{x^2}{3} - \dfrac{x}{2} + 3\cos x$. Let R be the shaded region in the second quadrant bounded by the graph of f, and let S be the shaded region bounded by the graph of f and line ℓ, the line tangent to the graph of f at $x = 0$, as shown above.

(a) Find the area of R. **(b)** Write an <u>integral expression</u> for Area of **S**