A graphing calculator is required for some problems or parts of problems.

"intersection
@ $x = 0.942$

let $F = .942$
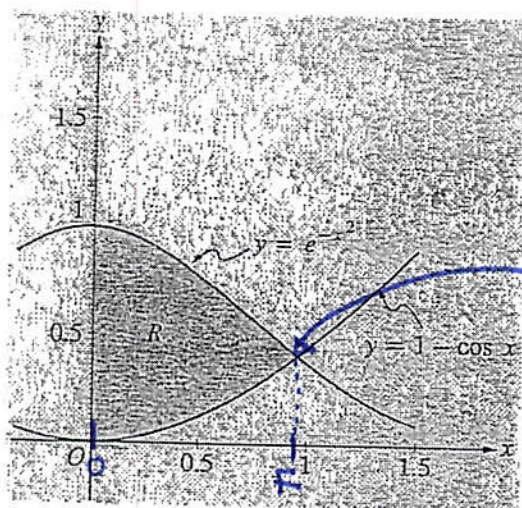
1. Let R be the shaded region in the first quadrant enclosed by the graphs of $y = e^{-x^2}$, $y = 1 - \cos x$, and the y-axis, as shown in the figure above.

(a) Find the area of the region R.

$$\text{Area of } R = \int_0^F \left(e^{-x^2} - (1 - \cos x) \right) dx$$

$$= 0.591$$

"intersection
@ $x = 1.488$

let $M = 1.488$
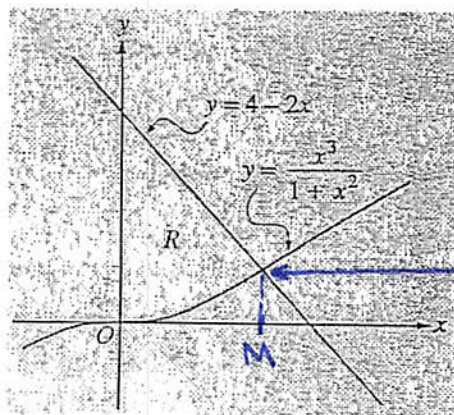
1. Let R be the region bounded by the y-axis and the graphs of $y = \dfrac{x^3}{1 + x^2}$ and $y = 4 - 2x$, as shown in the figure above.

(a) Find the area of R.

$$\text{Area of } R = \int_0^M \left(4 - 2x - \frac{x^3}{1 + x^2} \right) dx = 3.215$$
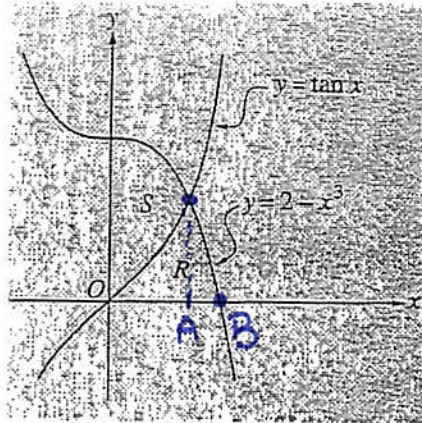
intersection
@ $x = 0.902$
let $A = 0.902$
x-int @ $x = 1.260$
let $B = 1.260$

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 $y = \tan x$.

(a) Find the area of R. ⟶
(b) Find the area of S.

a) Area of $R = \int_0^A \tan x \, dx + \int_A^B (2-x^3) \, dx$

$= \boxed{0.729}$

OR

Area of $R = \int_0^B (2-x^3) \, dx - \int_0^A (2-x^3 - \tan x) \, dx$

$= 0.729$

b) Area of $S = \int_0^A (2-x^3 - \tan x) \, dx$

$= \boxed{1.161}$