Calculator	2011 #1. For $0 \le t \le 6$, a particle is moving along the x-axis. The particles position, x(t), is not explicitly given. The velocity of the particle is given by $v(t) = 2\sin(e^{t/4}) + 1$. a. Find the total distance traveled by the particle from $0 \le t \le 6$, $\int_0^6 \lvert v(t) \rvert dt = 12.573$ 77. Water is pumped out of a lake at the rate $R(t) = 12\sqrt{\frac{t}{t+1}}$ cubic meters per minute, where t is measured in minutes. How much water is pumped from time t = 0 to t = 5? A) 9.439 cubic meters B) 10.954 cubic meters C) 43.816 cubic meters D) 47.193 cubic meters E) 54.772 cubic meters $\int_0^5 R(t) dt =$ 87. An object traveling in a straight line has position x(t) at time $t \ge 0$. If the initial position is x(0) = 2 and the velocity of the object is $v(t) = \sqrt[3]{1+t^2}$, what is the position of the object at time t = 3? A) .431 B) 2.154 C) 4.512 D) 6.512 E) 17.408 $2 + \int_0^3 v(t) dt =$ $\cancel{\int t(1+t^2)^{1/3} dt}$

What you'll Learn About

- Finding the area between 2 curves

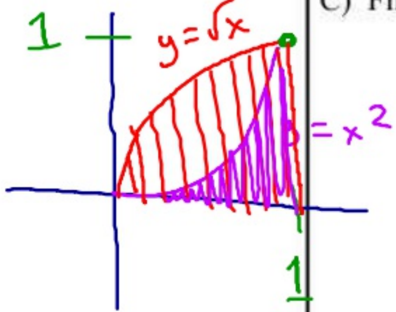
A) Find the area between the curve $y = \sqrt{x}$ and the x-axis from [0, 1].

$$A = \int_0^1 x^{1/2}\,dx = \frac{2}{3}x^{3/2}\Big]_0^1 = \frac{2}{3}$$

B) Find the area between the curve $y = x^2$ and the x-axis from [0, 1].

$$A = \int_0^1 x^2\,dx = \frac{1}{3}x^3\Big]_0^1 = \frac{1}{3}$$

C) Find the area between the curves $y = x^2$ and $y = \sqrt{x}$



$$A = \int_0^1 \sqrt{x}\,dx - \int_0^1 x^2\,dx$$

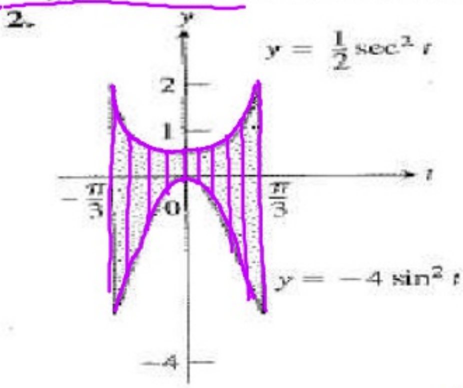
Top Curve − Bottom Curve

$$A = \int_0^1 \left(\sqrt{x} - x^2\right)dx = \frac{1}{3}$$

$$A = \cancel{\int_0^1 \left(x^{1/2} - x\right)dx = \left|-\frac{1}{3}\right|}$$

Using your calculator find the area of the shaded region.

2.



$$A = \int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \left[\frac{1}{2}\sec^2 t - (-4\sin^2 t)\right] dt$$

$A = 4.188$

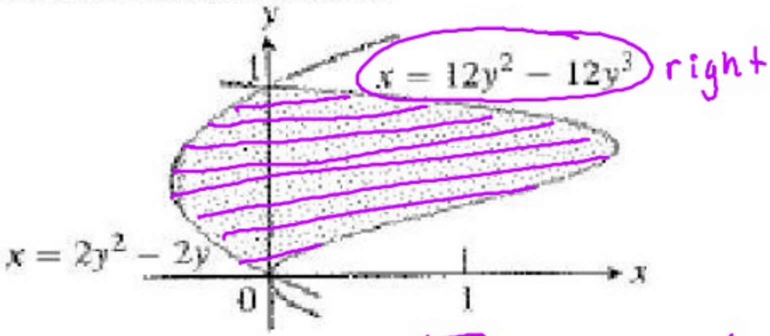
Top - Bottom

equations y =

everything x

Find the area of the shaded region.

4.



Equations

solved for x

Right - Left

everything y

$$A = \int_0^1 \left[(12y^2 - 12y^3) - (2y^2 - 2y)\right] dy$$

$$A = \int_0^1 (10y^2 - 12y^3 + 2y)\, dy$$

$$A = \frac{10}{3}y^3 - 3y^4 + y^2 \Big]_0^1 = \frac{10}{3} - 3 + 1 = \frac{4}{3}$$