AP® Calculus AB
2001 Sample Student Responses

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A1

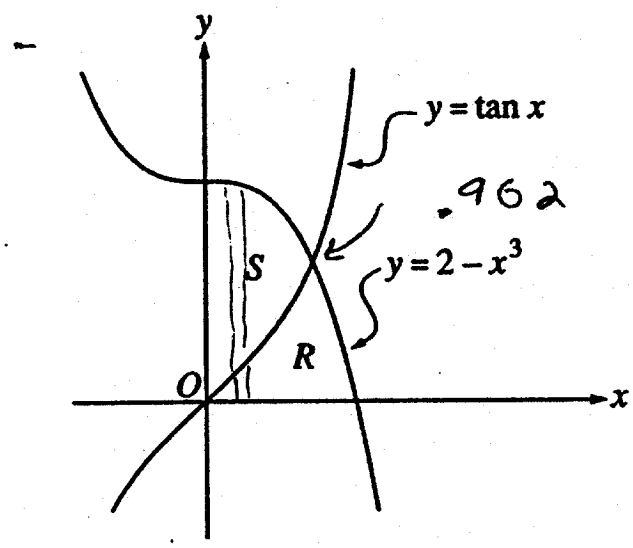
CALCULUS AB

SECTION II, Part A

Time—45 minutes

Number of problems—3

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



(.902, 1.266)

$3\sqrt{2-y}$

Work for problem 1(a)

Area of R: $\int_{\text{bottom}}^{\text{top}} [\text{Right}(y) - \text{Left}(y)]\, dy$

$$\int_0^{1.266} \left[\sqrt[3]{2-y} - \tan^{-1} y\right] dy$$

Area of R = .729

$\tan x + x^3 = 2$

$x = .902$

Work for problem 1(b)

Area of S: $\int_{Left}^{Right} [top(x) - bottom(x)]\,dx$

$\int_0^{.902} [(2-x^3) - \tan x]\,dx$

Area of S = 1.161

Work for problem 1(c)

Volume of S about the x-axis:

$\pi \int R(x)^2\,dx$

$\pi \int_0^{.902} [(2-x^3)^2 - \tan^2 x]\,dx$

Volume of S about the x-axis = 8.332

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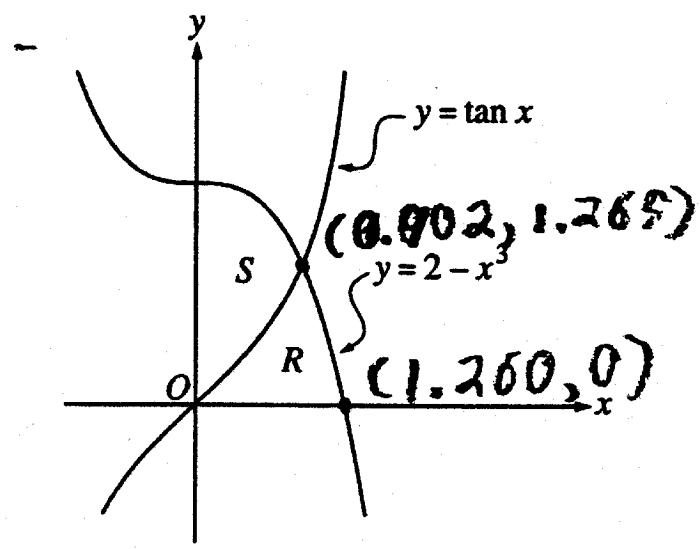
CALCULUS AB

SECTION II, Part A

Time—45 minutes

Number of problems—3

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



Work for problem 1(a)

$$A_2 = \int_0^{0.902} \tan x \, dx + \int_{0.902}^{1.260} 2 - x^3 \, dx =$$

$$0.478 + 0.251 = 0.729$$

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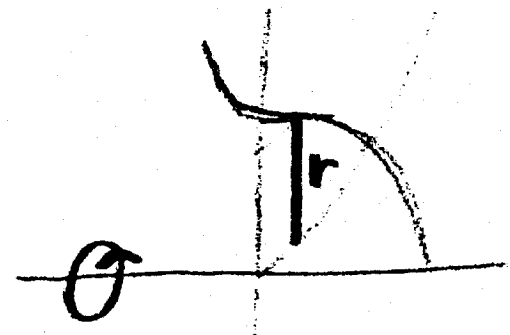
Work for problem 1(b)

$$A_S = \int_0^{0.902} (2-x^3) - \tan x \, dx$$

$$A_S = 1.160$$

Work for problem 1(c)



$$V = \int_0^{0.902} \pi ((2-x^3) - \tan x)^2 \, dx$$

$$V = 5.555$$