

CALCULUS

Background text includes: The Quotient Rule $\frac{d}{dx} \left(\frac{u}{v} \right) = \frac{v(du/dx) - u(dv/dx)}{v^2}$, The Product Rule $\frac{d}{dx}(uv) = v \frac{du}{dx} + u \frac{dv}{dx}$, Integration by Parts $\int u \frac{dv}{dx} = u v - \int v \frac{du}{dx}$, Implicit Differentiation, and various derivative formulas like $\frac{d}{dx}(\tan x) = \sec^2 x$ and $\frac{d}{dx}(\ln x) = \frac{1}{x}$.

Monday, Feb. 7

Handout p. 332 33, 35 CAS (Evaluate both with CAS)

Sec. 6.2 p. 417 (Evaluate at least 4 by hand)
a-d below, 5, 7, 11, 12

- (a) $f(x) = x\sqrt{1-x^2}$ [0,1] (b) $f(x) = 3|x+2|-3$ [-4,-1]
(c) $f(x) = -2|x-3|+6$ [1,7] (d) Area between $y = 4x$ & $y = x^2$

Wednesday, Feb. 9

(Evaluate at least 4 by hand)

Sec. 6.2 pp. 417-418 Set up only: 26, 27, 30
Find the area of the regions bounded by the given curves.

- (a) $y^2 = -x, y = x-6, y = -1, y = 4$ (b) $x = -y, x = 2 - y^2$
(c) $y = x, y = \frac{1}{x^2}, y = 4$ (d) $x = \frac{1}{y}, x = 0, y = 1, y = e$
(e) $y = x, y = 4x, y = -x+2$ (f) $x = y^2 - 4, y = \sqrt[3]{x+8}, y = -1$
(g) $x = y^3 - y, x = 0$

Friday, Feb. 11

(Evaluate at least 4 by hand)

Start Tile Project

Sec. 6.3 pp. 431-433 28, 31, 36-38, 62, a-d

about x-axis:

- (a) $y = \sqrt{25-x^2}, y = 3$ (b) $y = -x+7, y = x^2+3, y = \sqrt{9-x}$

about y-axis:

- (c) $x = y^2, x = y+2$ (d) $x = 1-y^2, x = 2+y^2, y = -1, y = 1$

Tuesday, Feb. 15

Math Matters Due

Handout p. 345

22-24, 31 (Evaluate at least 1 by hand)

Book Sec. 6.3 p. 430 7-9

Separate Handout p. 457
39-43

Evaluate at least 4
by hand

Thursday, Feb. 17

Sec. 6.4 pp. 442-444
6, 20, a, b, c

(Evaluate at
least 4 by
hand.)

Handout pp. 348-349
6, 8, 10, 12

about y-axis:

- (a) $y = 2x-1, y = -2x+3, x = 2$ (b) $y = e^{x^2}, x = 1, x = \sqrt{3}, y = 0$

about x-axis:

- (c) $xy = 4, x + y = 5$

Video—"Applying Area &
Volume: Dam Construction"

Tuesday, Feb. 22

Sec. 6.5 p. 450
17-25 odd

(Evaluate
all using
CAS.)

Sec. 6.6 p. 457
7, 17, 18, 27, 28

Start Volume Project

**Tile Project
Due**

Thursday, Feb. 24

Review Area & Volume

Work on Volume Project

**Journal
Due**

Monday, Feb. 28

Area & Volume Test

Volume Project Due Friday

AREA & VOLUME ANSWERS

Sec. 6.2 p. 417

- a) $\frac{1}{3}$ units²
b) $\frac{9}{2}$ units²
c) 18 units²
d) $\frac{32}{3}$ units²

26. $\int_0^1 ((y^3 - 4y^2 + 3y) - (y^2 - y)) dy +$
 $\int_1^4 ((y^2 - y) - (y^3 - 4y^2 + 3y)) dy = \frac{71}{6}$ units²

30. a) $\int_0^1 (\sqrt{x} - x^3) dx$ b) $\int_0^1 (\sqrt[3]{y} - y^2) dy$

- a) $\frac{355}{6}$ units²
b) $\frac{9}{2}$ units²
c) $\frac{11}{2}$ units²
d) 1 units²
e) $\frac{3}{5}$ units²
f) $\frac{45}{4}$ units²
g) $\frac{1}{2}$ units²

Sec. 6.3 p. 431-433

28. $\frac{\pi}{3}$ units³
36. $\frac{\pi(e^4 - 1)}{2}$ units³
38. $\frac{128\pi}{5}$ units³
62. 136 π units³
a) $\frac{256\pi}{3}$ units³
b) $\frac{122\pi}{5} + 18\pi = \frac{212\pi}{5}$ units³
c) $\frac{72\pi}{5}$ units³
d) 10 π units³

Sec. 6.3 (continued)

8. $\frac{4}{3}$ units³

Sec. 6.4 pp. 442-444

6. 45 π units³
20. 8 π units³
a. $\frac{20\pi}{3}$ units³
b. $\pi(e^3 - e)$ units³
c. 9 π units³

Sec. 6.6 p. 457

18. $\frac{8\pi}{3}(5\sqrt{5} - 2\sqrt{2})$
28. ≈ 3.845 units²