

### Calculus — Problem Set 43

2. 4 units<sup>2</sup>

4.  $\approx 1.9287$  units<sup>2</sup>

6.

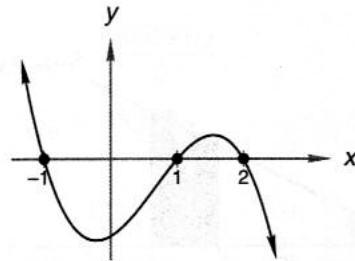
$$\frac{dy}{dx} = \sec x(e^x + 1) + \tan x \sec x(e^x + x)$$

$$8. = \frac{du}{v} - \frac{udv}{v^2}$$

10. -1 unit/s

12.  $\frac{dy}{dx} = \frac{e^x}{2\sqrt{e^x - 1}}$

14.  $6\sqrt{u} + C$



16.

18. Local max:

(1.5486, 0.6311)

Local min:

(-0.2153, -2.1126)

20.  $-\infty$

22.  $f(x) = 2(x-1)(x+2)$

$= -\cos x \cos x + 1$

24.  $= 1 - \cos^2 x = \sin x$

### Calculus — Problem Set 44

2. a)  $x^2 y = 27$

b)  $A = 2x^2 + 4xy$

c)  $A = 2x^2 + 108x^{-1}$

d)  $\{x \in \mathbb{R} | x > 0\}$

$x \approx 2.9999968$

e)  $A = 54 \text{ units}^2$

4.  $\frac{dy}{dx} = \frac{3x^2 + e^x}{x^3 + e^x}$

6. -2

8. 9 units<sup>2</sup>

10.

$$y' = \frac{1}{x(\sin x + \cos x)} -$$

$$\frac{\ln x(\cos x - \sin x)}{1 + \sin(2x)}$$

12.  $-\frac{2 \text{ unit}}{3 \text{ s}}$

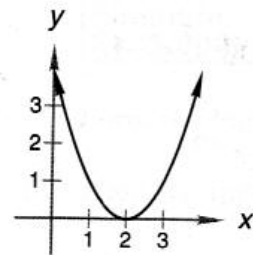
14.  $6t^{1/2} + 4 \sin t + 2t^3 + 6t + C$

16.

$$(fg)(x) = 12e^x(\cos x + \sin x)$$

18.  $h'(x) = -x(x^2 - 4)^{3/2}$

20. 0



22.

24. B