

Calculus — Problem Set 39

2. $\frac{95}{4}$ units²

4. $4e^x - 2x^{1/2} + 6x + C$

6. $\frac{dy}{dx} = -e^{\cos x} \sin x$

8. $\frac{dy}{dx} = 3 \sin^2 x \cos x$

10. $\frac{dx}{dt} = -\frac{y}{x} \frac{dy}{dt}$

12. ≈ -0.4234

14. a) 0.5
b) $\frac{1}{2}$

16. does not exist

18. False. The function may not exist at $x = 1$, but the limits still could.

20. $a = 2, b = -2, c = -4$

22. 22,140

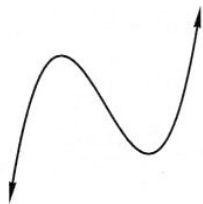
$= \sin x \sin x + \cos x \cos x$

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

Calculus — Problem Set 40

2. $-1 \frac{\text{unit}}{s}$

4. a) $x = -2, 1$
b)



Local maximum: $(-2, 12)$

Local minimum: $(1, -\frac{3}{2})$

6. $\frac{77}{8}$ units²

8. Min.:
 $(2.3874, -5.4165)$
Max:
 $(0.2792, -0.73165)$

10.
 $-2 \cos x - 2x^2 - x^{3/2} - 3x + C$

12. $x + \ln|x| + C$

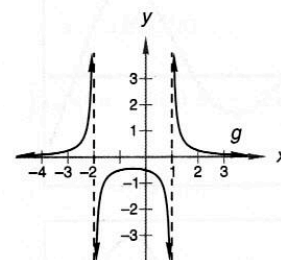
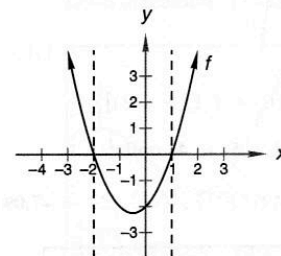
14. $\frac{ds}{dx} = \cot x$

16. $\frac{dy}{dx} = \frac{\cos x - y}{x + \sin y}$

18. $-\frac{1}{2}$

20.

$f(x) = x^2 + x - 2 = (x + \frac{1}{2})^2 - \frac{9}{4}$



22. $-\frac{1}{2}$

24. 672,400