

Calculus — Problem Set 31

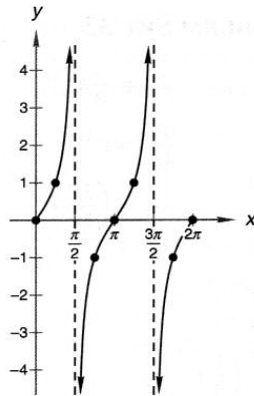
2. $t = \frac{\ln 6}{\ln \sqrt{3}} \approx 3.2619$ min.

4. $\frac{dy}{dx} = 3(t \sin t - \cos t)$

6. $ds = 2x^2 dy + 4xy dx$

8. $f'''(t) = -3 \cos t - \sqrt{2}e^t$

10.



12. $y = \frac{1}{3}x + \frac{4}{3}$

14. $-\frac{9}{2}$

16. $x = \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{13\pi}{12}, \frac{5\pi}{4}, \frac{7\pi}{4}, \frac{23\pi}{12}$

18. The equation is an ellipse with center at $(0, 1)$.

20. 0

22. If the contrapositive is not true, then the conditional statement is not true.

24. $PA = 3\sqrt{3}$ units

Calculus — Problem Set 32

2. a)

$$(y + 4)^2 + (x + 4)^2 = 12^2$$

b) $\frac{y}{4} = \frac{4}{x}$

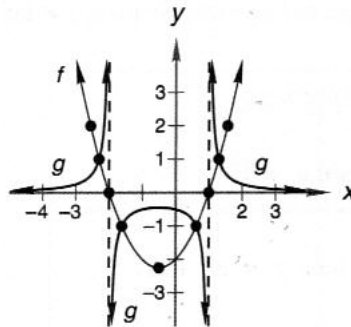
4. $t^3 + C$

6. $\int e^t dt = e^t + C$

8. $y = \ln|x| + C$

10. $h'(x) = e^x(\cos x + \sin x)$

12.



14. $\frac{dy}{dx} = \frac{3}{2}x^{-1/4} + 4x^{-2}$

16. $\sin \frac{x}{2} = \pm \sqrt{\frac{1}{2} - \frac{1}{2} \cos x}$

$$\cos \frac{x}{2} = \pm \sqrt{\frac{1}{2} + \frac{1}{2} \cos x}$$

18. $f(3) = 5$

20.

$$\{x \in \mathbb{R} \mid 0.6 < x < 1.4\}$$

22. $-\frac{2\sqrt{2}}{27}$

24.

$$m_1 = 1$$

$$m_2 = -1$$