

1.

3. Sample answer: If one of the cars slowed down, the distance between the two cars would grow at a slower rate. Therefore, the average rate of change of the distance between the two cars would be smaller. If one of the cars sped up, the distance between the two cars would grow at a faster rate. Therefore, the average rate of change of the distance between the two cars would be larger. 5. For $t = 1$, $A \approx 79 \text{ cm}^2$. For $t = 2$, $A \approx 314 \text{ cm}^2$. For $t = 3$, $A \approx 707 \text{ cm}^2$. For $t = 4$, $A \approx 1257 \text{ cm}^2$. For $t = 5$, $A \approx 1963 \text{ cm}^2$. 7. For $t = 2$, m approaches $314 \text{ cm}^2/\text{sec}$. For $t = 3$, m approaches $471 \text{ cm}^2/\text{sec}$. For $t = 4$, m approaches $628 \text{ cm}^2/\text{sec}$. 9. Sample answer: In the first activity, the graph resembled a linear function. Therefore, the average rate of change could be found by using any two points since the rate of change remained constant. In the second activity, the graph resembled a quadratic function. The difference quotient had to be used to approximate the rate of change at each individual value of t .

CHAPTER 5 Trigonometric Identities and Equations

Page 311 Chapter 1 Get Ready

1. $-8, 3$ 3. $-\frac{1}{2}, 5$ 5. $-2, 0, 3$ 7. 12 s 9. $a \approx 13.62$, $b \approx 23.30$, $A = 32^\circ$ 11. $k \approx 9.13$, $J \approx 42.63^\circ$, $L \approx 75.37^\circ$
13. $\frac{\sqrt{2}}{2}$ 15. $-\sqrt{3}$ 17. $\frac{1}{2}$

Pages 317–319 Lesson 5-1

1. $\frac{7}{5}$ 3.5 5. $\frac{\sqrt{35}}{35}$ 7. $\frac{7\sqrt{10}}{20}$ 9. $\sec \theta = \sqrt{26}$, $\cos \theta = \frac{1}{\sqrt{26}}$
or $\frac{\sqrt{26}}{26}$ 11. $\tan \theta = \sqrt{15}$, $\sin \theta = \frac{\sqrt{15}}{4}$ 13. $\cos \theta = \frac{\sqrt{55}}{8}$,
 $\tan \theta = \frac{3}{\sqrt{55}}$ or $\frac{3\sqrt{55}}{55}$ 15. $\cot \theta = -\frac{2}{\sqrt{77}}$ or $-\frac{2\sqrt{77}}{77}$,
 $\sin \theta = \frac{\sqrt{77}}{9}$ 17. -1.24 19. 1.52 21. -1.35 23. $\sin x$
25. $2 \sin x$ 27. $2 \cos x$ 29. $\tan x$ 31. $\sin x \cos x$ 33. $\sin x$
35. $\cot x - \cos x + \tan x + \sin x \tan x$

(37) a. $I = I_0 - \frac{I_0}{\csc^2 \theta}$
 $= I_0 \left(1 - \frac{1}{\csc^2 \theta} \right)$
 $= I_0 (1 - \sin^2 \theta)$
 $= I_0 \cos^2 \theta$
 b. $I = I_0 \cos^2 \theta$
 $= I_0 \left(\frac{\sqrt{3}}{2} \right)^2$
 $= I_0 \left(\frac{3}{4} \right)$
 $= \frac{3I_0}{4}$

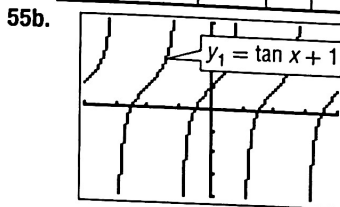
Thus, $\frac{3}{4}$ of the original intensity emerges.

For Homework Help, go to Hotmath.com

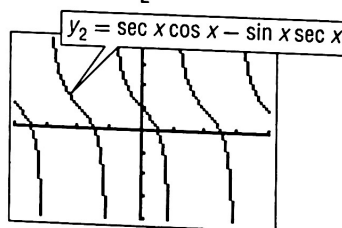
39. $\sec^2 x (\csc x + 1)$ 41. $\sec x (\csc x - 1)$ 43. $2 - 2 \cos x$
45. $\cos x (\csc x + 1)$ 47. $\sec x - 1$ 49. Even; the graph shown is $f(x) = \sec x$. $f(-x) = \sec(-x) = \sec x = f(x)$. Since $f(-x) = f(x)$, $f(x) = \sec x$ is an even function. 51. $-\cot x$
53. $-\csc x$

55a.

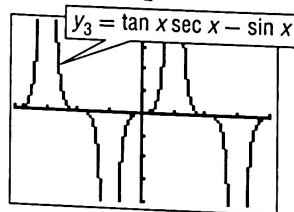
x	-2π	$-\pi$	0	π	2π
y_1	1	1	1	1	1
y_2	1	1	1	1	1
y_3	0	0	0	0	0
y_4	0	0	0	0	0



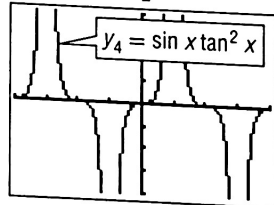
$[-2\pi, 2\pi]$ scl: $\frac{\pi}{2}$ by $[-4, 4]$ scl: 1



$[-2\pi, 2\pi]$ scl: $\frac{\pi}{2}$ by $[-4, 4]$ scl: 1



$[-2\pi, 2\pi]$ scl: $\frac{\pi}{2}$ by $[-4, 4]$ scl: 1



$[-2\pi, 2\pi]$ scl: $\frac{\pi}{2}$ by $[-4, 4]$ scl: 1

55c. $y_1 \neq y_2$, $y_3 = y_4$ 55d. Sample answer: The graphs of y_1 and y_2 support the conjecture that $y_1 \neq y_2$. Although the table from part a and the graphs of y_3 and y_4 support the conjecture that $y_3 = y_4$, it is impossible to determine whether the two equations are equal over the entire domain unless the equations are verified algebraically. 57. $-2 \ln |\cos x|$

59. $\ln |\csc^2 x|$ 61a. $\csc \theta = \frac{d}{m\lambda}$ 61b. $\theta = 0.11$ radian

63. Jenelle; $\frac{1 - \sin^2 x}{\sin^2 x - \cos^2 x} = \frac{1 - \sin^2 x}{(1 - \cos^2 x) - \cos^2 x}$
 $= \frac{\cos^2 x}{1 - 2 \cos^2 x}$ 65. $\sin x = \pm \sqrt{1 - \cos^2 x}$,

$\csc x = \pm \frac{\sqrt{1 - \cos^2 x}}{1 - \cos^2 x}$, $\sec x = \frac{1}{\cos x}$, $\tan x = \pm \frac{\sqrt{1 - \cos^2 x}}{\cos x}$,

$\cot x = \pm \frac{\cos x \sqrt{1 - \cos^2 x}}{1 - \cos^2 x}$ 67. False; sample answer: The

domain does not include values of x where $\csc x$ is undefined, such as $n\pi$.