1. (a) F (b) T (c) T (d) F (e) T (f) T (g) F (h) F

2. (a) B (b) C (c) A (d) B (e) C

3. (a) $y = x$ (b) $210°$ (c) $\frac{8}{\pi}$ meters (d) $2, \frac{2\pi}{3}, -\frac{\pi}{3}$

(e) $\sin\theta = \frac{\text{opp}}{\text{hyp}}$, $\cos\theta = \frac{\text{adj}}{\text{hyp}}$, $\tan\theta = \frac{\text{opp}}{\text{adj}}$, $\csc\theta = \frac{\text{hyp}}{\text{opp}}$, $\sec\theta = \frac{\text{hyp}}{\text{adj}}$, $\cot\theta = \frac{\text{adj}}{\text{opp}}$

(f) $\frac{\sqrt{3}}{2}$ (g) $-\frac{1}{2}$ (h) 1 (i) $-1 \le x \le 1, \quad 0 \le y \le \pi$ (j) $-\frac{\pi}{4}$ (k) $\frac{3\pi}{4}$ (l) $\frac{5\pi}{6}$ (m) $-\frac{\pi}{6}$

(n) $\frac{4}{5}$ (o) $\frac{\cos x}{\sin x}$ (p) $1 + \tan^2 x$ (q) $\cos x \cos y + \sin x \sin y$

(r) $\cos^2 x - \sin^2 x = 2\cos^2 x - 1 = 1 - 2\sin^2 x$ (s) $\pm\sqrt{\frac{1-\cos x}{2}}$ (t) $y = -2$ (u) $3^x = 8$ (v) x (w) 5

(x) 7 (y) $2\log x + \log y - \frac{1}{2}\log(x+1)$ (z) $\ln\frac{x^2 - y^2}{x^3}$

4. (a) $\frac{2x-1}{(x-1)^2}$ (b) $\frac{x(x+3)}{(x+4)(x+1)}$

5. (a) $x = \pm 2, \frac{3}{2}$ (b) $x = -6, 3$ (c) $x = k\pi, \quad x = \frac{\pi}{6} + 2k\pi, \quad x = \frac{5\pi}{6} + 2k\pi$, k is an integer

(d) $x = \frac{3\pi}{2} + 2k\pi, \quad x = \frac{\pi}{6} + 2k\pi, \quad x = \frac{5\pi}{6} + 2k\pi$, k is an integer

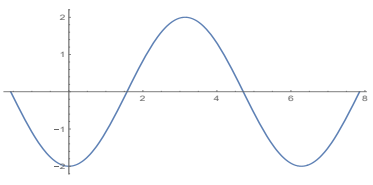
(e)) $x = \frac{5+\log_2 7}{3} = \frac{5\ln 2 + \ln 7}{3\ln 2} = \frac{\ln 32 + \ln 7}{\ln 8} = \frac{\ln 224}{\ln 8}$

(f) $x = -15$ (g) $x = 1$ (h) $x = 3$, $x = -4$ is an extraneous solution.

6. (a) $[1, 4]$ (b) $(-\infty, -1) \cup \left(\frac{7}{3}, \infty\right)$ (c) $[-7, 4)$

7. The amplitude is 2, the period is 2π and horizontal shift is $\pi/2$ to the right.

The graph of $y = 2\sin\left(x - \frac{\pi}{2}\right)$ on $\left[-\frac{\pi}{2}, \frac{5\pi}{2}\right]$.



8. $x = \frac{200}{\sqrt{3}}$ feet

9. $\frac{40 \sin 35°}{\sin 51°}$ meters

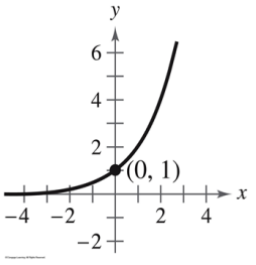
10. $\cos^{-1}\left(\frac{210^2+230^2-120^2}{(2)(210)(230)}\right)$ feet

11. (a) $\sin\theta = \frac{1}{\sqrt{10}} = \frac{\sqrt{10}}{10}$ (b) $\sec\theta = -\frac{\sqrt{10}}{3}$ (c) $\sin 2\theta = -\frac{3}{5}$ (d) $\cos 2\theta = \frac{4}{5}$

12. (a) $L = \cos^2 x \csc x - \csc x = \csc x\left(\cos^2 x - 1\right) = \csc x\left(-\sin^2 x\right) = \dfrac{1}{\sin x}\left(-\sin^2 x\right) = -\sin x = R$

(b) $L = \dfrac{1}{1-\sin^2 x} = \dfrac{1}{\cos^2 x} = \sec^2 x = 1 + \tan^2 x = R$

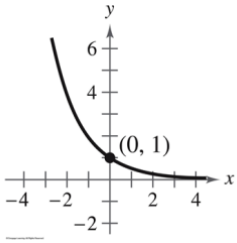
13.



$f(x) = 2^x$

D: $(-\infty, \infty)$ Horizontal Asymptote: y= 0

The *y*-intercept is $(0, 1)$.

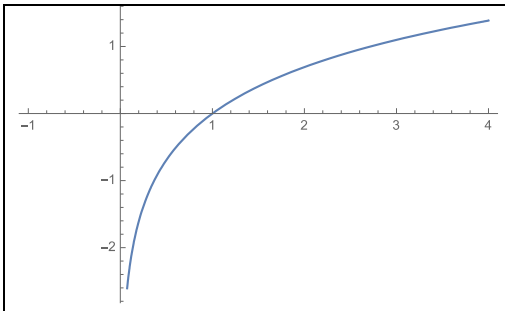


$g(x) = 2^{-x}$

D: $(-\infty, \infty)$ Horizontal Asymptote: y= 0

The *y*-intercept is $(0, 1)$.

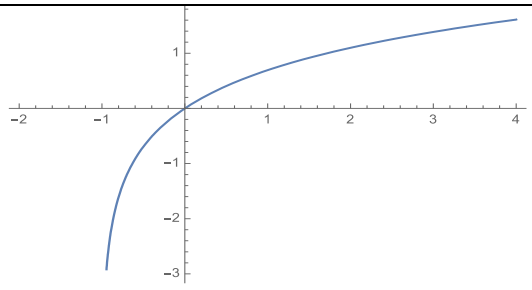
14.



$f(x) = \ln x$

D: $(0, \infty)$ Vertical Asymptote: $x = 0$

The *x*-intercept is $(1, 0)$.



$g(x) = \ln(x + 1)$

D: $(-1, \infty)$ Vertical Asymptote: $x = -1$

The *x*-intercept is $(0, 0)$.