T/PC

Ch 4 Trig Review p. 400-401 13, 23, 33, 34, 41, 51, 56, 63, 75, 79, 83, 90, 94, 97, 102

Day 1

13. $\theta = 120^\circ = \frac{2\pi}{3}$ radians

23. $\sec\left(-\frac{\pi}{3}\right) = 2$

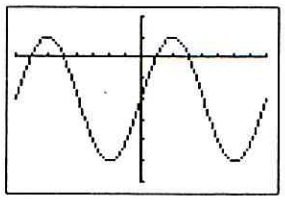
33. The hypotenuse length is 13 cm, so $\sin\alpha = \frac{5}{13}$, $\cos\alpha = \frac{12}{13}$, $\tan\alpha = \frac{5}{12}$, $\csc\alpha = \frac{13}{5}$, $\sec\alpha = \frac{13}{12}$, $\cot\alpha = \frac{12}{5}$.

34. Draw a right triangle with legs 5 (adjacent) and $\sqrt{7^2 - 5^2} = \sqrt{24} = 2\sqrt{6}$, and hypotenuse 7.
$\sin\theta = \frac{2\sqrt{6}}{7}$, $\cos\theta = \frac{5}{7}$, $\tan\theta = \frac{2\sqrt{6}}{5}$; $\csc\theta = \frac{7}{2\sqrt{6}}$, $\sec\theta = \frac{7}{5}$, $\cot\theta = \frac{5}{2\sqrt{6}}$.

41. $b = a\tan\beta = 7\tan 48^\circ \approx 7.774$, $c = \frac{a}{\cos\beta} = \frac{7}{\cos 48^\circ} \approx 10.461$, $\alpha = 90^\circ - \beta = 42^\circ$

51. $OP = \sqrt{34}$, so $\sin\theta = -\frac{3}{\sqrt{34}}$, $\cos\theta = -\frac{5}{\sqrt{34}}$, $\tan\theta = \frac{3}{5}$; $\csc\theta = -\frac{\sqrt{34}}{3}$, $\sec\theta = -\frac{\sqrt{34}}{5}$, $\cot\theta = \frac{5}{3}$.

56. Starting from $y = \sin x$, translate right π units, vertically stretch by 3, reflect across x-axis, and translate down 2 units.



$[-2\pi, 2\pi]$ by $[-6, 2]$

63. $f(x) = 1.5\sin\left[2\left(x - \frac{\pi}{8}\right)\right]$. Amplitude: 1.5; period: π; phase shift: $\frac{\pi}{8}$; domain: $(-\infty, \infty)$; range: $[-1.5, 1.5]$.

75. Starting from $y = \sin^{-1}x$, translate right 1 unit, horizontally shrink by $\frac{1}{3}$, translate up 2 units. Domain: $\left[0, \frac{2}{3}\right]$.

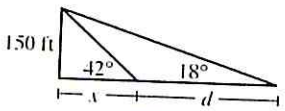
79. $x = \frac{3\pi}{4}$

83. As $|x| \to \infty$, $\frac{\sin x}{x^2} \to 0$.

90. Not periodic. Domain: $(-\infty, \infty)$. Range: $[-1, 1]$.

94. Draw a right triangle with horizontal leg x (if $x \geq 0$, draw the horizontal leg right; if $x \leq 0$, draw it left), vertically leg $\sqrt{1 - x^2}$, and hypotenuse 1. If $x \geq 0$, let θ be the acute angle adjacent to the horizontal leg; if $x \leq 0$, let θ be the supplement of this angle. Then $\theta = \cos^{-1}x$, so $\tan\theta = \tan(\cos^{-1}x) = \frac{\sqrt{1 - x^2}}{x}$.

97. $\tan 42^\circ = \frac{150\text{ ft}}{x}$ and $\tan 18^\circ = \frac{150\text{ ft}}{d + x}$, so $x = 150\cot 42^\circ$ and $d + x = 150\cot 18^\circ$. Then $d = 150\cot 18^\circ - 150\cot 42^\circ \approx 295$ ft.



102. Let θ be the angle of elevation. Note that $\sin\theta = \frac{h}{75\text{ ft}}$, so $h = 75\sin\theta$.

(a) If $\theta = 22^\circ$, then $h = 75\sin 22^\circ \approx 28$ ft.

(b) If $\theta = 27^\circ$, then $h = 75\sin 27^\circ \approx 34$ ft.