88. $-210.55° = -210.55°\left(\dfrac{\pi}{180°}\right) \approx -3.675$ radians

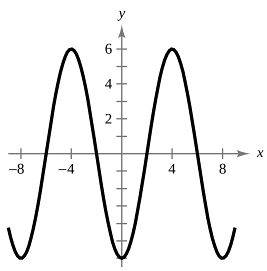
90. $\cos 60° = \dfrac{x}{28} \implies x = 28 \cos 60° = 14$

92. $\sin 70° = \dfrac{x}{10} \implies x = 10 \cdot \sin 70° \approx 9.397 \approx 9.4$

94. $f(x) = -6 \cos \dfrac{\pi x}{4}$

Amplitude: 6

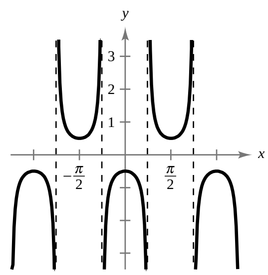
Period: $\dfrac{2\pi}{\left(\dfrac{\pi}{4}\right)} = 8$



96. $f(x) = \dfrac{1}{2} \sec(2x + \pi)$

Asymptotes: $2x + \pi = -\dfrac{\pi}{2} \implies x = -\dfrac{3\pi}{4}$

$2x + \pi = \dfrac{\pi}{2} \implies x = -\dfrac{\pi}{4}$



Section 5.4 Sum and Difference Formulas

Solutions to Even-Numbered Exercises

2. (a) $\sin\left(\dfrac{2\pi}{3} + \dfrac{3\pi}{4}\right) = \sin \dfrac{2\pi}{3} \cos \dfrac{3\pi}{4} + \cos \dfrac{2\pi}{3} \sin \dfrac{3\pi}{4}$

$= \dfrac{\sqrt{3}}{2}\left(-\dfrac{\sqrt{2}}{2}\right) + \left(-\dfrac{1}{2}\right)\dfrac{\sqrt{2}}{2} = \dfrac{-\sqrt{6} - \sqrt{2}}{4}$

(b) $\sin \dfrac{2\pi}{3} + \sin \dfrac{3\pi}{4} = \dfrac{\sqrt{3}}{2} + \dfrac{\sqrt{2}}{2} = \dfrac{\sqrt{3} + \sqrt{2}}{4}$

4. (a) $\cos\left(\dfrac{5\pi}{4} - \dfrac{\pi}{6}\right) = \cos \dfrac{5\pi}{4} \cos \dfrac{\pi}{6} + \sin \dfrac{5\pi}{4} \sin \dfrac{\pi}{6}$

$= \left(-\dfrac{\sqrt{2}}{2}\right)\dfrac{\sqrt{3}}{2} + \left(-\dfrac{\sqrt{2}}{2}\right)\dfrac{1}{2} = \dfrac{-\sqrt{6} - \sqrt{2}}{4}$

(b) $\cos \dfrac{5\pi}{4} - \cos \dfrac{\pi}{6} = -\dfrac{\sqrt{2}}{2} - \dfrac{\sqrt{3}}{2} = \dfrac{-\sqrt{3} - \sqrt{2}}{2}$

6. (a) $\cos(240° - 0°) = \cos 240° = -\frac{1}{2}$

(b) $\cos 240° - \cos 0° = -\frac{1}{2} - 1 = -\frac{3}{2}$

8. (a) $\sin(390° + 120°) = \sin 510° = \sin 150° = \frac{1}{2}$

(b) $\sin 390° + \sin 120° = \sin 30° + \sin 120° = \dfrac{1}{2} + \dfrac{\sqrt{3}}{2} = \dfrac{1 + \sqrt{3}}{2}$

10. $15° = 45° - 30°$

$$\sin 15° = \sin(45° - 30°) = \sin 45° \cos 30° - \cos 45° \sin 30°$$
$$= \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right) = \frac{\sqrt{2}\left(\sqrt{3} - 1\right)}{4} = \frac{\sqrt{2}}{4}\left(\sqrt{3} - 1\right)$$

$$\cos 15° = \cos(45° - 30°) = \cos 45° \cos 30° + \sin 45° \sin 30°$$
$$= \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right) = \frac{\sqrt{2}\left(\sqrt{3} + 1\right)}{4} = \frac{\sqrt{2}}{4}\left(\sqrt{3} + 1\right)$$

$$\tan 15° = \tan(45° - 30°) = \frac{\tan 45° - \tan 30°}{1 + \tan 45° \tan 30°}$$
$$= \frac{1 - \dfrac{\sqrt{3}}{3}}{1 + (1)\left(\dfrac{\sqrt{3}}{3}\right)} = \frac{\dfrac{3 - \sqrt{3}}{3}}{\dfrac{3 + \sqrt{3}}{3}} = \frac{3 - \sqrt{3}}{3 + \sqrt{3}} \cdot \frac{3 - \sqrt{3}}{3 - \sqrt{3}} = \frac{12 - 6\sqrt{3}}{6} = 2 - \sqrt{3}$$

12. $165° = 135° + 30°$

$$\sin 165° = \sin(135° + 30°) = \sin 135° \cos 30° + \sin 30° \sin 135°$$
$$= \sin 45° \cos 30° - \sin 30° \cos 45°$$
$$= \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{1}{2} \cdot \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{4}\left(\sqrt{3} - 1\right)$$

$$\cos 165° = \cos(135° + 30°) = \cos 135° \cos 30° - \sin 135° \sin 30°$$
$$= -\cos 45° \cos 30° - \sin 45° \sin 30°$$
$$= -\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = -\frac{\sqrt{2}}{4}\left(\sqrt{3} + 1\right)$$

$$\tan 165° = \tan(135° + 30°) = \frac{\tan 135° + \tan 30°}{1 - \tan 135° \tan 30°} = \frac{-\tan 45° + \tan 30°}{1 + \tan 45° \tan 30°}$$
$$= \frac{-1 + \left(\sqrt{3}/3\right)}{1 + \left(\sqrt{3}/3\right)} = -2 + \sqrt{3}$$

14. $285° = 330° - 45°$

$$\sin 285° = \sin(330° - 45° = \sin 330° \cos 45° - \cos 330° \sin 45°$$
$$= \left(-\frac{1}{2}\right)\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\left(\frac{\sqrt{2}}{2}\right) = \frac{-\sqrt{6} - \sqrt{2}}{4}$$

$$\cos 285° = \cos(330° - 45°) = \cos 330° \cos 45° + \sin 330° \sin 45°$$
$$= \frac{\sqrt{3}}{2}\frac{\sqrt{2}}{2} + \left(-\frac{1}{2}\right)\frac{\sqrt{2}}{2} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

$$\tan 285° = \tan(330° - 45°) = \frac{\tan 330° - \tan 45°}{1 + \tan 330° \tan 45°}$$
$$= \frac{-\dfrac{\sqrt{3}}{3} - 1}{1 + \left(-\dfrac{\sqrt{3}}{3}\right)(1)} = \frac{\sqrt{3} + 3}{\sqrt{3} - 3} = -2 - \sqrt{3}$$

16. $\dfrac{17\pi}{12} = \dfrac{7\pi}{6} + \dfrac{\pi}{4}$

$$\sin\frac{17\pi}{12} = \sin\left(\frac{7\pi}{6} + \frac{\pi}{4}\right) = \sin\frac{7\pi}{6}\cos\frac{\pi}{4} + \cos\frac{7\pi}{6}\sin\frac{\pi}{4}$$
$$= \left(-\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(-\frac{\sqrt{3}}{2}\right)\frac{\sqrt{2}}{2} = \frac{-\sqrt{6} - \sqrt{2}}{4}$$

$$\cos\frac{17\pi}{12} = \cos\left(\frac{7\pi}{6} + \frac{\pi}{4}\right) = \cos\frac{7\pi}{6}\cos\frac{\pi}{4} - \sin\frac{7\pi}{6}\sin\frac{\pi}{4}$$
$$= \left(-\frac{\sqrt{3}}{2}\right)\frac{\sqrt{2}}{2} - \left(-\frac{1}{2}\right)\frac{\sqrt{2}}{2} = \frac{\sqrt{2} - \sqrt{6}}{4}$$

$$\tan\frac{17\pi}{12} = \tan\left(\frac{7\pi}{6} + \frac{\pi}{4}\right) = \frac{\tan\frac{7\pi}{6} + \tan\frac{\pi}{4}}{1 - \tan\frac{7\pi}{6}\tan\frac{\pi}{4}}$$
$$= \frac{\frac{\sqrt{3}}{3} + 1}{1 - \frac{\sqrt{3}}{3}(1)} = \frac{\sqrt{3} + 3}{3 - \sqrt{3}} = 2 + \sqrt{3}$$

18. $-\dfrac{19\pi}{12} = \dfrac{2\pi}{3} - \dfrac{9\pi}{4}$

$$\sin\left(-\frac{19\pi}{12}\right) = \sin\left(\frac{2\pi}{3} - \frac{9\pi}{4}\right) = \sin\frac{2\pi}{3}\cos\frac{9\pi}{4} - \cos\frac{2\pi}{3}\sin\frac{9\pi}{4}$$
$$= \frac{\sqrt{3}}{2}\frac{\sqrt{2}}{2} - \left(-\frac{1}{2}\right)\frac{\sqrt{2}}{2} = \frac{\sqrt{6} + \sqrt{2}}{4}$$

$$\cos\left(-\frac{19\pi}{12}\right) = \cos\left(\frac{2\pi}{3} - \frac{9\pi}{4}\right) = \cos\frac{2\pi}{3}\cos\frac{9\pi}{4} + \sin\frac{2\pi}{3}\sin\frac{9\pi}{4}$$
$$= \left(-\frac{1}{2}\right)\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\frac{\sqrt{2}}{2} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

$$\tan\left(-\frac{19\pi}{12}\right) = \tan\left(\frac{2\pi}{3} - \frac{9\pi}{4}\right) = \frac{\tan\frac{2\pi}{3} - \tan\frac{9\pi}{4}}{1 + \tan\frac{2\pi}{3}\tan\frac{9\pi}{4}}$$
$$= \frac{-\sqrt{3} - 1}{1 + \left(-\sqrt{3}\right)(1)} = \frac{\sqrt{3} + 1}{\sqrt{3} - 1} = 2 + \sqrt{3}$$

20. $\sin 110^\circ \cos 80^\circ + \cos 110^\circ \sin 80^\circ = \sin(110^\circ + 80^\circ) = \sin(190^\circ)$

22. $\cos 20^\circ \cos 30^\circ + \sin 20^\circ \sin 30^\circ = \cos(30^\circ - 20^\circ)$
$= \cos 10^\circ$

24. $\dfrac{\tan 140^\circ - \tan 60^\circ}{1 + \tan 140^\circ \tan 60^\circ} = \tan(140^\circ - 60^\circ) = \tan 80^\circ$

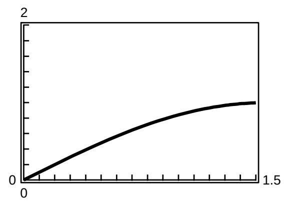
26. $\cos 0.88 \cos 0.34 + \sin 0.88 \sin 0.34 = \cos(0.88 - 0.34) = \cos(0.54)$

28. $\sin\dfrac{2\pi}{9}\cos\dfrac{\pi}{10} + \cos\dfrac{2\pi}{9}\sin\dfrac{\pi}{10} = \sin\left(\dfrac{2\pi}{9} + \dfrac{\pi}{10}\right) = \sin\left(\dfrac{29\pi}{90}\right)$

30.

x	0.2	0.4	0.6	0.8	1.0	1.2	1.4
y_1	0.1987	0.3894	0.5646	0.7174	0.8415	0.9320	0.9854
y_2	0.1987	0.3894	0.5646	0.7174	0.8415	0.9320	0.9854

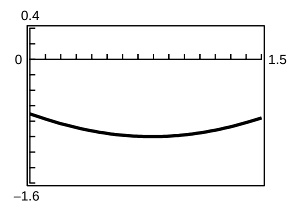
$$\begin{aligned} y_1 &= \sin(3\pi - x) \\ &= \sin 3\pi \cos x - \cos 3\pi \sin x \\ &= 0 - (-1) \sin x \\ &= \sin x \\ &= y_2 \end{aligned}$$



32.

x	0.2	0.4	0.6	0.8	1.0	1.2	1.4
y_1	−0.8335	−0.9266	−0.9829	−0.9999	−0.9771	−0.9153	−0.8170
y_2	−0.8335	−0.9266	−0.9829	−0.9999	−0.9771	−0.9153	−0.8170

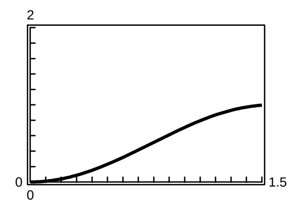
$$\begin{aligned} y_1 = \cos\left(\frac{5\pi}{4} - x\right) &= \cos\frac{5\pi}{4}\cos x + \sin\frac{5\pi}{4}\sin x \\ &= -\frac{\sqrt{2}}{2}\cos x - \frac{\sqrt{2}}{2}\sin x \\ &= -\frac{\sqrt{2}}{2}(\cos x + \sin x) \\ &= y_2 \end{aligned}$$

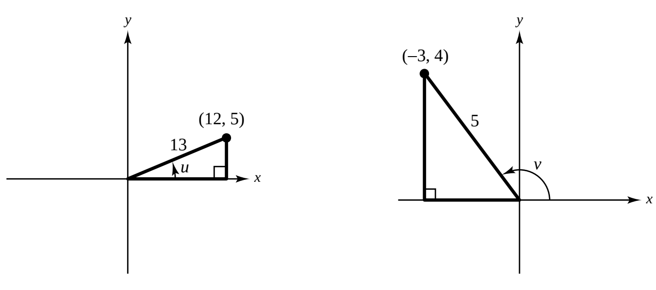


34.

x	0.2	0.4	0.6	0.8	1.0	1.2	1.4
y_1	0.0395	0.1516	0.3188	0.5146	0.7081	0.8687	0.9711
y_2	0.0395	0.1516	0.3188	0.5146	0.7081	0.8687	0.9711

$$\begin{aligned} y_1 &= \sin(x + \pi)\sin(x - \pi) \\ &= [\sin x \cos \pi + \sin \pi \cos x][\sin x \cos \pi - \sin \pi \cos x] \\ &= [-\sin x][-\sin x] \\ &= \sin^2 x \\ &= y_2 \end{aligned}$$

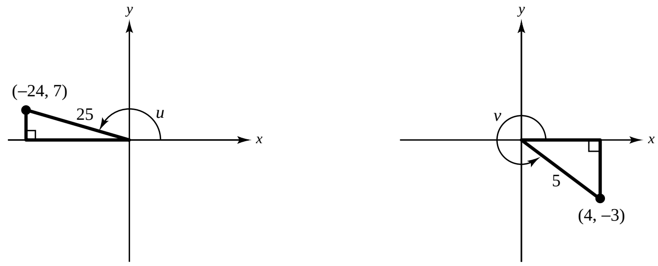




Figures for Exercises 36 and 38

36. $$\begin{aligned} \cos(v - u) &= \cos v \cos u + \sin v \sin u \\ &= \left(-\tfrac{3}{5}\right)\left(+\tfrac{12}{13}\right) + \left(\tfrac{4}{5}\right)\left(\tfrac{5}{13}\right) \\ &= -\tfrac{36}{65} + \tfrac{20}{65} = -\tfrac{16}{65} \end{aligned}$$

38. $$\begin{aligned} \sin(u - v) &= \sin u \cos v - \cos u \sin v \\ &= \left(\tfrac{5}{13}\right)\left(-\tfrac{3}{5}\right) - \left(+\tfrac{12}{13}\right)\left(\tfrac{4}{5}\right) \\ &= -\tfrac{15}{65} - \tfrac{48}{65} = -\tfrac{63}{65} \end{aligned}$$



Figures for Exercises 40 and 42

40. $\sin(u + v) = \sin u \cos v + \cos u \sin v$
$= \left(+\frac{7}{25}\right)\left(+\frac{4}{5}\right) + \left(-\frac{24}{25}\right)\left(-\frac{3}{5}\right)$
$= \frac{28}{125} + \frac{72}{125} = \frac{100}{125} = \frac{4}{5}$

42. $\cos(u - v) = \cos u \cos v + \sin u \sin v$
$= \left(-\frac{24}{25}\right)\left(+\frac{4}{5}\right) + \left(+\frac{7}{25}\right)\left(-\frac{3}{25}\right)$
$= -\frac{96}{125} + -\frac{21}{125} = -\frac{117}{125}$

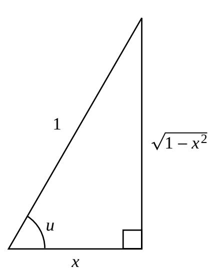
44. $\sin(\theta + \pi) + \cos\left(\theta - \dfrac{\pi}{2}\right) = [\sin\theta\cos\pi + \cos\theta\sin\pi] + \cos\left(\dfrac{\pi}{2} - \theta\right)$
$= [-\sin\theta + 0] + \sin\theta = 0$

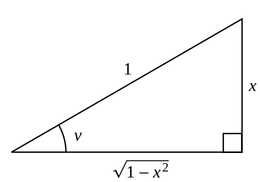
46. $\tan\left(\dfrac{\pi}{4} - \theta\right) = \dfrac{\tan(\pi/4) - \tan\theta}{1 + \tan(\pi/4)\tan\theta} = \dfrac{1 - \tan\theta}{1 + \tan\theta}$

48. $\cos(x + y) + \cos(x - y) = \cos x \cos y - \sin x \sin y + \cos x \cos y + \sin x \sin y$
$= 2\cos x \cos y$

50. $\sin(x + y)\sin(x - y) = [\sin x \cos y + \cos x \sin y][\sin x \cos y - \cos x \sin y]$
$= \sin^2 x \cos^2 y - \cos^2 x \sin^2 y$
$= \sin^2 x(1 - \sin^2 y) - \cos^2 x \sin^2 y$
$= \sin^2 x - \sin^2 y(\sin^2 x + \cos^2 x)$
$= \sin^2 x - \sin^2 y$

52. Let $u = \arccos x$ and $v = \arcsin x$
$\cos u = x$ $\sin v = x$

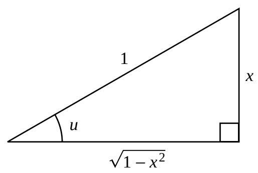


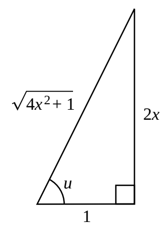


$\cos(\arccos x - \arcsin x) = \cos(\arccos x)\cos(\arcsin x) + \sin(\arccos x)\sin(\arcsin x)$
$= x\sqrt{1 - x^2} + \sqrt{1 - x^2}\,x$
$= 2x\sqrt{1 - x^2}$

54. Let $u = \arcsin x$ and $v = \arctan 2x$

$\sin u = x$ $\tan v = 2x$





$$\begin{aligned}\cos(\arcsin x - \arctan 2x) &= \cos(\arcsin x)\cos(\arctan 2x) + \sin(\arcsin x)\sin(\arctan 2x)\\ &= \sqrt{1-x^2}\,\frac{1}{\sqrt{4x^2+1}} + x\,\frac{2x}{\sqrt{4x^2+1}}\\ &= \frac{2x^2+\sqrt{1-x^2}}{\sqrt{4x^2+1}}\end{aligned}$$

56.

$$\begin{aligned}\sin\left(x+\frac{\pi}{6}\right) - \sin\left(x-\frac{\pi}{6}\right) &= \frac{1}{2}\\ \sin x\cos\frac{\pi}{6} + \cos x\sin\frac{\pi}{6} - \left(\sin x\cos\frac{\pi}{6} - \cos x\sin\frac{\pi}{6}\right) &= \frac{1}{2}\\ 2\cos x(0.5) &= \frac{1}{2}\\ \cos x &= \frac{1}{2}\\ x &= \frac{\pi}{3}, \frac{5\pi}{3}\end{aligned}$$

58.

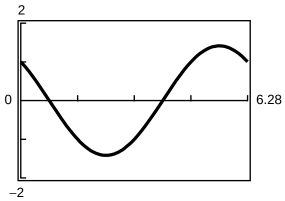
$$\begin{aligned}\cos\left(x+\frac{\pi}{6}\right) - \cos\left(x-\frac{\pi}{6}\right) &= 1\\ \left[\cos x\cos\frac{\pi}{6} - \sin x\sin\frac{\pi}{6}\right] - \left[\cos x\cos\frac{\pi}{6} + \sin x\sin\frac{\pi}{6}\right] &= 1\\ -2\sin x\sin\frac{\pi}{6} &= 1\\ \sin x &= -1\\ x &= \frac{3\pi}{2}\end{aligned}$$

60.

$$\begin{aligned}2\sin\left(x+\frac{\pi}{2}\right) + 3\tan(\pi - x) &= 0\\ 2\left[\sin x\cos\frac{\pi}{2} + \cos x\sin\frac{\pi}{2}\right] + 3\tan(-x) &= 0\\ 2\cos x - 3\,\frac{\sin x}{\cos x} &= 0\\ 2\cos^2 x - 3\sin x &= 0\\ 2(1-\sin^2 x) - 3\sin x &= 0\\ 2\sin^2 x + 3\sin x - 2 &= 0\end{aligned}$$

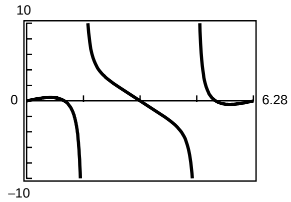
$$(2\sin x - 1)(\sin x + 2) \quad\Longrightarrow\quad \sin x = \frac{1}{2} \quad\Longrightarrow\quad x = \frac{\pi}{6}, \frac{5\pi}{6}$$

62. $\sin\left(x + \frac{\pi}{2}\right) - \cos\left(x + \frac{3\pi}{2}\right) = 0$



$x \approx 0.7854, 3.9270$

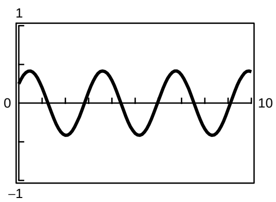
64. $\tan(\pi - x) + 2\cos\left(x + \frac{3\pi}{2}\right) = 0$



$x = 0, 1.0472, \pi, 5.2360$

66. $y = \frac{1}{3}\sin 2t + \frac{1}{4}\cos 2t$

(a)



(b) $a = \frac{1}{3},\ b = \frac{1}{4},\ B = 2$

$C = \arctan\frac{b}{a} = \arctan\frac{3}{4} \approx 0.6435$

$y \approx \sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{1}{4}\right)^2}\ \sin(2t + 0.6435)$

$= \frac{5}{12}\sin(2t + 0.6435)$

(c) Amplitude: $\frac{5}{12}$

(d) Frequency: $\frac{1}{\text{period}} = \frac{b}{2\pi} = \frac{2}{2\pi} = \frac{1}{\pi}$

68. False. $\cos(u \pm v) = \cos u \cos v \mp \sin u \sin v$

70. True. $\sin\left(x - \frac{11\pi}{2}\right) = \sin x \cos\frac{11\pi}{2} - \cos x \sin\frac{11\pi}{2} = 0 - \cos x(-1) = \cos x$

72. $\sin(n\pi + \theta) = \sin n\pi \cos\theta + \sin\theta\cos n\pi$

$= (0)(\cos\theta) + (\sin\theta)(-1)^n$

$= (-1)^n(\sin\theta)$, where n is an integer.

74. $C = \arctan\frac{a}{b} \implies \sin C = \frac{a}{\sqrt{a^2 + b^2}}, \cos C = \frac{b}{\sqrt{a^2 + b^2}}$

$\sqrt{a^2 + b^2}\cos(B\theta - C) = \sqrt{a^2 + b^2}\left(\cos B\theta \cdot \frac{b}{\sqrt{a^2 + b^2}} + \sin B\theta \cdot \frac{a}{\sqrt{a^2 + b^2}}\right)$

$= b\cos B\theta + a\sin B\theta$

$= a\sin B\theta + b\cos B\theta$

76. $3 \sin 2\theta + 4 \cos 2\theta$

$a = 3, b = 4, B = 2$

(a) $C = \arctan \frac{b}{a} = \arctan \frac{4}{3} \approx 0.9273$

$$3 \sin 2\theta + 4 \cos 2\theta = \sqrt{a^2 + b^2} \sin(B\theta + C) \approx 5 \sin(2\theta + 0.9273)$$

(b) $C = \arctan \frac{a}{b} = \arctan \frac{3}{4} \approx 0.6435$

$$3 \sin 2\theta + 4 \cos 2\theta = \sqrt{a^2 + b^2} \cos(B\theta - C) \approx 5 \cos(2\theta - 0.6435)$$

78. $\sin 2\theta - \cos 2\theta$

$a = 1, b = -1, B = 2$

(a) $C = \arctan \frac{b}{a} = \arctan(-1) = -\frac{\pi}{4}$

$$\sin 2\theta - \cos 2\theta = \sqrt{a^2 + b^2} \sin(B\theta + C) = \sqrt{2} \sin\left(2\theta - \frac{\pi}{4}\right)$$

(b) Because $b > 0$ in the formula, we write the given expression as:

$-(-\sin 2\theta + \cos 2\theta)$

$a = -1, b = 1, B = 2,$

$C = \arctan\left(\frac{a}{b}\right) = \arctan(-1) = -\frac{\pi}{4}$

Hence,

$$-(-\sin 2\theta + \cos 2\theta) = -\sqrt{a^2 + b^2} \cos(B\theta - C) = -\sqrt{2} \cos\left(2\theta + \frac{\pi}{4}\right).$$

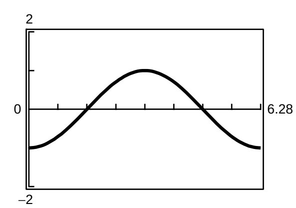
80. $C = -\frac{\pi}{4} = \arctan\left(\frac{a}{b}\right) \quad \Rightarrow \quad \frac{a}{b} = -1 \quad \Rightarrow \quad a = -1, b = 1$

$\sqrt{a^2 + b^2} = \sqrt{2}$. Hence, $B = 1$ and

$$5 \cos\left(\theta + \frac{\pi}{4}\right) = \frac{5}{\sqrt{2}} \sqrt{2} \cos\left[\theta - \left(-\frac{\pi}{4}\right)\right]$$
$$= \frac{5}{\sqrt{2}} [-\sin \theta + \cos \theta]$$
$$= -\frac{5}{\sqrt{2}} \sin \theta + \frac{5}{\sqrt{2}} \cos \theta$$
$$= -\frac{5\sqrt{2}}{2} \sin \theta + \frac{5\sqrt{2}}{2} \cos \theta$$

82. The graph of $g(x) = \cos(\pi + x)$ looks like that of $f(x) = -\cos x$. Analytically,

$g(x) = \cos(\pi + x) = \cos \pi \cdot \cos x - \sin \pi \cdot \sin x = -\cos x.$



84. $$\frac{\cos(x + h) - \cos x}{h} = \frac{\cos x \cos h - \sin x \sin h - \cos x}{h} = \frac{\cos x(\cos h - 1)}{h} - \frac{\sin x \sin h}{h}$$