1. Given $\sin\theta$, determine $\cos\theta$.

   (a) $\sin\theta = \dfrac{2}{3}$

   (b) $\sin\theta = \dfrac{\sqrt{3}}{2}$

   (c) $\sin\theta = -\dfrac{5}{6}$

2. Given $\cos\theta$, determine $\sin\theta$.

   (a) $\cos\theta = \dfrac{1}{3}$

   (b) $\cos\theta = -\dfrac{\sqrt{2}}{5}$

   (c) $\cos\theta = -\dfrac{3}{5}$

3. Given $\tan\theta$, determine $\sec\theta$.

   (a) $\tan\theta = -\dfrac{12}{5}$

   (b) $\tan\theta = -2$

   (c) $\tan\theta = \dfrac{\sqrt{3}}{4}$

4. Determine $\cos\theta$ from the given information.

   (a) $\sin\theta = \dfrac{2}{3}$ and $\dfrac{\pi}{2} < \theta < \pi$

   (b) $\sin\theta = \dfrac{\sqrt{3}}{2}$ and $0 < \theta < \dfrac{\pi}{2}$

   (c) $\sin\theta = -\dfrac{5}{6}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

5. Determine $\sin\theta$ from the given information

   (a) $\cos\theta = \dfrac{1}{3}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

   (b) $\cos\theta = -\dfrac{\sqrt{2}}{5}$ and $\pi < \theta < \dfrac{3\pi}{2}$

   (c) $\cos\theta = -\dfrac{3}{5}$ and $\dfrac{\pi}{2} < \theta < \pi$

6. Evaluate. (Hint: Use an addition or subtraction formula.)

   (a) $\cos\left(\dfrac{13\pi}{12}\right)$

   (b) $\sin\left(\dfrac{11\pi}{12}\right)$

   (c) $\cos\left(\dfrac{7\pi}{12}\right)$

   (d) $\sin\left(\dfrac{\pi}{12}\right)$

   (e) $\cos\left(\dfrac{17\pi}{12}\right)$

   (f) $\sin\left(-\dfrac{\pi}{12}\right)$

   (g) $\sin\left(-\dfrac{5\pi}{12}\right)$

   (h) $\cos\left(-\dfrac{\pi}{12}\right)$

7. If x is in Quadrant IV with $\cos(x) = \dfrac{3}{5}$ and y is in Quadrant III with $\sin(y) = -\dfrac{2}{\sqrt{5}}$, find

(a) $\cos(x+y)$ (b) $\sin(x+y)$ (c) $\cos(x-y)$ (d) $\sin(x-y)$

8. Find $\sin(2x)$ and $\cos(2x)$ from the given information.

(a) $\cos x = -\dfrac{2}{5}$ and $\dfrac{\pi}{2} < x < \pi$ (b) $\sin x = \dfrac{1}{7}$ and $0 < x < \dfrac{\pi}{2}$

(c) $\cos x = -\dfrac{2}{3}$ and $\dfrac{\pi}{2} < x < \pi$ (d) $\cos x = \dfrac{4}{5}$ and $\dfrac{3\pi}{2} < x < 2\pi$

(e) $\cos x = -\dfrac{3}{5}$ and $\pi < x < \dfrac{3\pi}{2}$ (f) $\sin x = \dfrac{3}{\sqrt{10}}$ and $\dfrac{\pi}{2} < x < \pi$

9. Evaluate the following. (Hint. Use a formula for $\sin^2 x$ or $\cos^2 x$.)

(a) $\sin\left(\dfrac{\pi}{8}\right)$ (b) $\sec\left(\dfrac{3\pi}{8}\right)$ (c) $\csc\left(\dfrac{5\pi}{8}\right)$

(d) $\cos\left(\dfrac{7\pi}{8}\right)$ (e) $\sin\left(\dfrac{3\pi}{8}\right)$ (f) $\cos\left(\dfrac{5\pi}{8}\right)$

Answers

1. (a) $\cos\theta = \pm\dfrac{\sqrt{5}}{3}$ (b) $\cos\theta = \pm\dfrac{1}{2}$ (c) $\cos\theta = \pm\dfrac{\sqrt{11}}{6}$

2. (a) $\sin\theta = \pm\dfrac{2\sqrt{2}}{3}$ (b) $\sin\theta = \pm\dfrac{\sqrt{23}}{5}$ (c) $\sin\theta = \pm\dfrac{4}{5}$

3. (a) $\sec\theta = \pm\dfrac{13}{5}$ (b) $\sec\theta = \pm\sqrt{5}$ (c) $\sec\theta = \pm\dfrac{\sqrt{19}}{4}$

4. (a) $\cos\theta = -\dfrac{\sqrt{5}}{3}$ (b) $\cos\theta = \dfrac{1}{2}$ (c) $\cos\theta = \dfrac{\sqrt{11}}{6}$

5. (a) $\sin\theta = -\dfrac{2\sqrt{2}}{3}$ (b) $\sin\theta = -\dfrac{\sqrt{23}}{5}$ (c) $\sin\theta = \dfrac{4}{5}$

6. (a) $-\dfrac{\sqrt{6}+\sqrt{2}}{4}$ (b) $\dfrac{\sqrt{6}-\sqrt{2}}{4}$ (c) $\dfrac{\sqrt{2}-\sqrt{6}}{4}$ (d) $\dfrac{\sqrt{6}-\sqrt{2}}{4}$

    (e) $\dfrac{\sqrt{2}-\sqrt{6}}{4}$ (f) $\dfrac{\sqrt{2}-\sqrt{6}}{4}$ (g) $-\dfrac{\sqrt{6}+\sqrt{2}}{4}$ (h) $\dfrac{\sqrt{6}+\sqrt{2}}{4}$

7. (a) $-\dfrac{11\sqrt{5}}{25}$ (b) $-\dfrac{2\sqrt{5}}{25}$ (c) $\dfrac{\sqrt{5}}{5}$ (d) $\dfrac{2\sqrt{5}}{5}$

8. (a) $\sin(2x) = -\dfrac{4\sqrt{21}}{25}, \cos(2x) = -\dfrac{17}{25}$ (b) $\sin(2x) = \dfrac{8\sqrt{3}}{49}, \cos(2x) = \dfrac{47}{49}$

   (c) $\sin(2x) = -\dfrac{4\sqrt{5}}{9}, \cos(2x) = -\dfrac{1}{9}$ (d) $\sin(2x) = -\dfrac{24}{25}, \cos(2x) = \dfrac{7}{25}$

   (e) $\sin(2x) = \dfrac{24}{25}, \cos(2x) = -\dfrac{7}{25}$ (f) $\sin(2x) = -\dfrac{3}{5}, \cos(2x) = -\dfrac{4}{5}$

9. (a) $\dfrac{\sqrt{2-\sqrt{2}}}{2}$ (b) $\dfrac{2}{\sqrt{2-\sqrt{2}}}$ (c) $\dfrac{2}{\sqrt{2+\sqrt{2}}}$

(d) $-\dfrac{\sqrt{2+\sqrt{2}}}{2}$
(e) $\dfrac{\sqrt{2+\sqrt{2}}}{2}$
(f) $-\dfrac{\sqrt{2-\sqrt{2}}}{2}$