21. Determine the Cartesian coordinates of the following trigonometric points.

a) $P\left(-\frac{\pi}{6}\right)$ $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ b) $P\left(-\frac{3\pi}{4}\right)$ $\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ c) $P\left(-\frac{4\pi}{3}\right)$ $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

d) $P\left(\frac{7\pi}{3}\right)$ $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ e) $P\left(\frac{31\pi}{6}\right)$ $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ f) $P\left(-\frac{13\pi}{4}\right)$ $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

22. From the Cartesian coordinates of the remarkable trigonometric points, determine the exact value of

a) $\sin\left(\frac{2\pi}{3}\right)$ $\frac{\sqrt{3}}{2}$ b) $\cos\left(\frac{7\pi}{6}\right)$ $-\frac{\sqrt{3}}{2}$ c) $\sin\left(\frac{3\pi}{4}\right)$ $\frac{\sqrt{2}}{2}$

d) $\sin\left(\frac{3\pi}{2}\right)$ -1 e) $\cos\left(\frac{11\pi}{6}\right)$ $\frac{\sqrt{3}}{2}$ f) $\cos\left(\frac{4\pi}{3}\right)$ $-\frac{1}{2}$

23. Determine the exact value of

a) $\sin\left(-\frac{\pi}{6}\right)$ $-\frac{1}{2}$ b) $\cos\left(-\frac{\pi}{3}\right)$ $\frac{1}{2}$ c) $\sin\left(\frac{13\pi}{6}\right)$ $\frac{1}{2}$

d) $\cos\left(\frac{19\pi}{4}\right)$ $-\frac{\sqrt{2}}{2}$ e) $\sin\left(-\frac{7\pi}{3}\right)$ $-\frac{\sqrt{3}}{2}$ f) $\cos\left(-\frac{17\pi}{4}\right)$ $\frac{\sqrt{2}}{2}$

24. Determine the exact value of

a) $\tan\left(\frac{2\pi}{3}\right)$ $-\sqrt{3}$ b) $\cot\left(\frac{5\pi}{6}\right)$ $-\sqrt{3}$

c) $\sec\left(\frac{7\pi}{6}\right)$ $-\frac{2\sqrt{3}}{3}$ d) $\csc\left(\frac{11\pi}{6}\right)$ -2

25. Knowing that $0 \leq t \leq 2\pi$, determine the two values of t such that

a) $\cos t = \frac{1}{2}$ $\frac{\pi}{3}$ or $\frac{5\pi}{3}$ b) $\sin t = \frac{\sqrt{3}}{2}$ $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

c) $\cos t = \frac{-\sqrt{3}}{2}$ $\frac{5\pi}{6}$ or $\frac{7\pi}{6}$ d) $\sin t = -\frac{1}{2}$ $\frac{7\pi}{6}$ or $\frac{11\pi}{6}$

26. Find t if

a) $\sin t = \frac{1}{2}$ and $\frac{\pi}{2} \leq t \leq \frac{3\pi}{2}$ $t = \frac{5\pi}{6}$ b) $\cos t = \frac{-1}{2}$ and $\pi \leq t \leq \frac{3\pi}{2}$ $t = \frac{4\pi}{3}$

c) $\sin t = \frac{-\sqrt{3}}{2}$ and $\frac{3\pi}{2} \leq t \leq 2\pi$ $t = \frac{5\pi}{3}$ d) $\cos t = \frac{1}{2}$ and $0 \leq t \leq \frac{\pi}{2}$ $t = \frac{\pi}{3}$

27. Knowing that $0 \leq t \leq 360°$, find the two values of t (to the nearest tenth) such that

a) $\cos t = 0.8$ **36.9° or 323.1°** b) $\cos t = -0.6$ **126.9° or 233.1°**

c) $\sin t = 0.2$ **11.5° or 168.5°** d) $\sin t = -0.4$ **203.6° or 336.4°**

28. Knowing that $0 \leq t \leq 2\pi$, find the two values of t (to the nearest hundredth) such that

a) $\sin t = 0.7$ **0.78 rad or 2.37 rad** b) $\sin t = -0.6$ **5.64 rad or 3.79 rad**

c) $\cos t = 0.2$ **1.37 rad or 4.91 rad** d) $\cos t = -0.8$ **2.50 rad or 3.79 rad**