MTH 162, Homework #1, Spring 2025 Name _____

Instructions: Write your work up neatly and attach to this page. Record your final answers (only) directly on this page if they are short; if too long indicate which page of the work the answer is on and mark it clearly. Use exact values unless specifically asked to round.

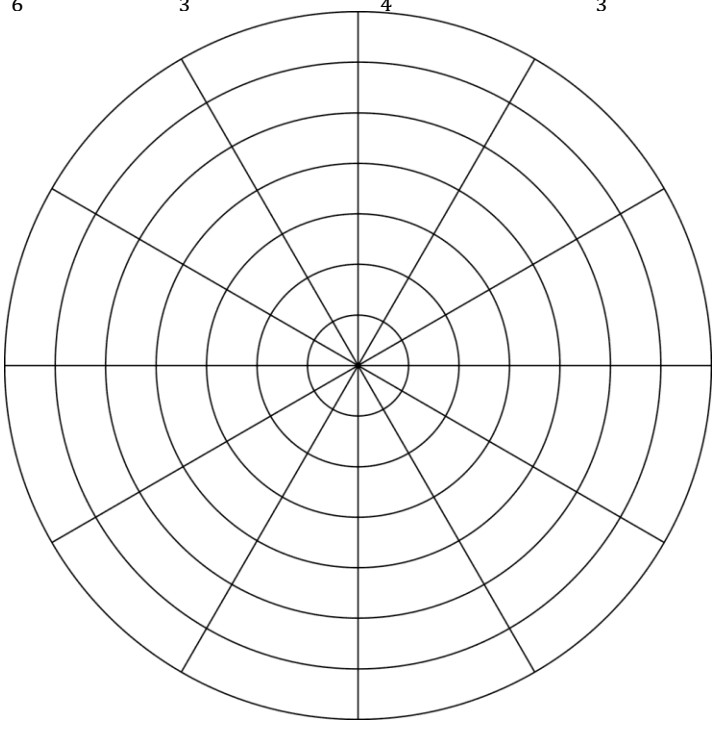
1. Convert the angles to radians (in terms of π).
   a. $45°$ b. $330°$ c. $76°$ d. $250°$ e. $-150°$

2. Convert the angle to degrees. Round to 2 places if necessary.
   a. $\frac{\pi}{2}$ b. $\frac{2\pi}{3}$ c. -3π d. 2 e. $\frac{\pi}{17}$

3. Find two angles coterminal with each angle.
   a. $\frac{7\pi}{6}$ b. $-\frac{2\pi}{3}$ c. $120°$ d. $405°$ e. $\frac{16\pi}{3}$

4. Find the reference angle for each angle.
   a. $\frac{19\pi}{6}$ b. $\frac{2\pi}{3}$ c. $\frac{3\pi}{4}$ d. $-\frac{38\pi}{9}$ e. $240°$

5. Draw the angle on the circle graph below.
   a. $\frac{5\pi}{6}$ b. $\frac{\pi}{3}$ c. $\frac{11\pi}{4}$ d. $-\frac{2\pi}{3}$ e. $-\pi$



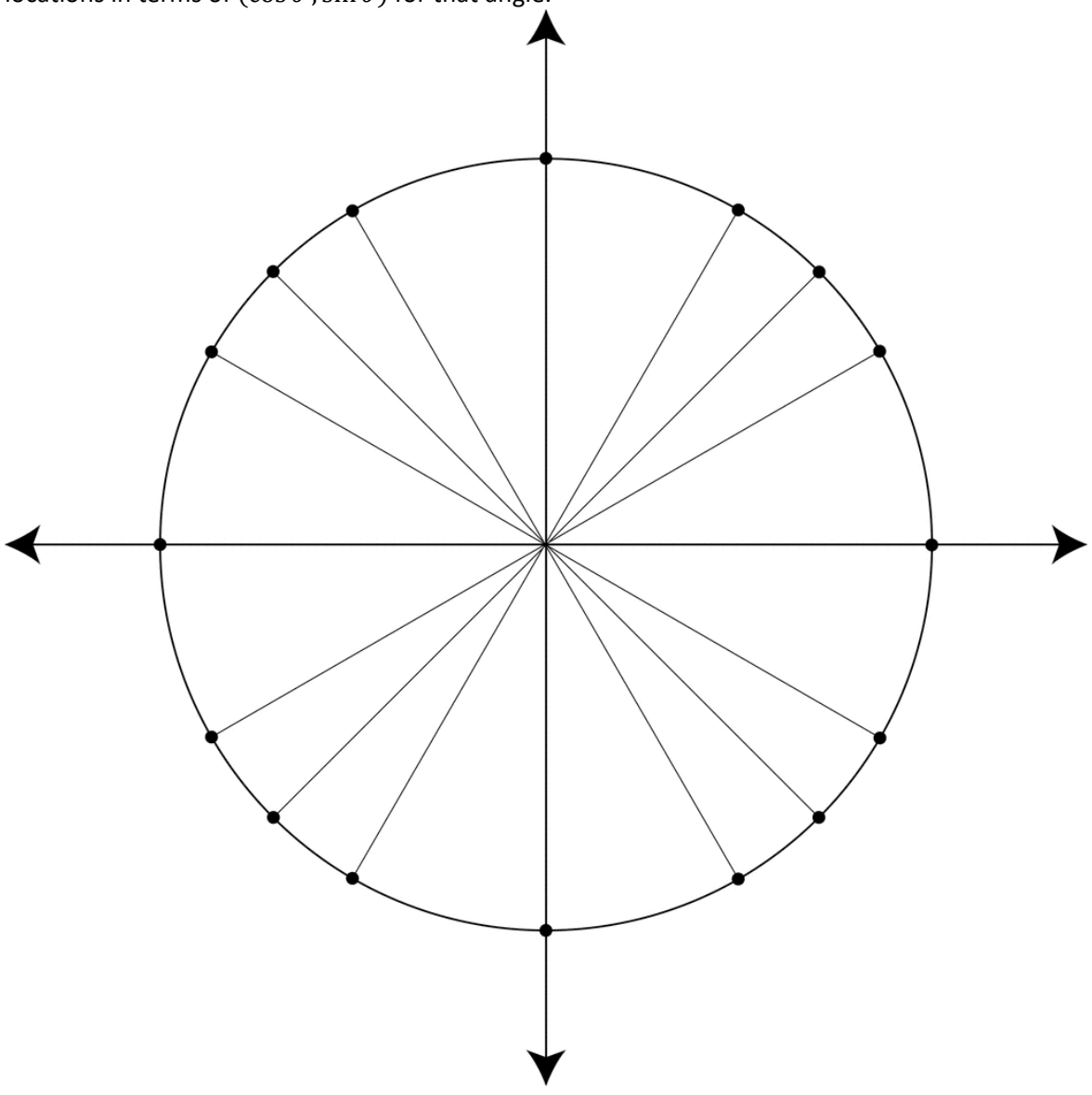
6. Find the values of the other 5 trig functions based on the information given.
   a. $\cos\theta = \frac{\sqrt{3}}{2}, 0 \le \theta < \frac{\pi}{2}$
   b. $\sin\theta = \frac{8}{17}, \cos\theta > 0$
   c. $\tan\theta = u, \sin\theta > 0$
   d. $\csc\theta = \sqrt{2}, 0 \le \theta < \pi$
   e. $\sin\theta = \frac{-6}{7}, \cos\theta < 0$

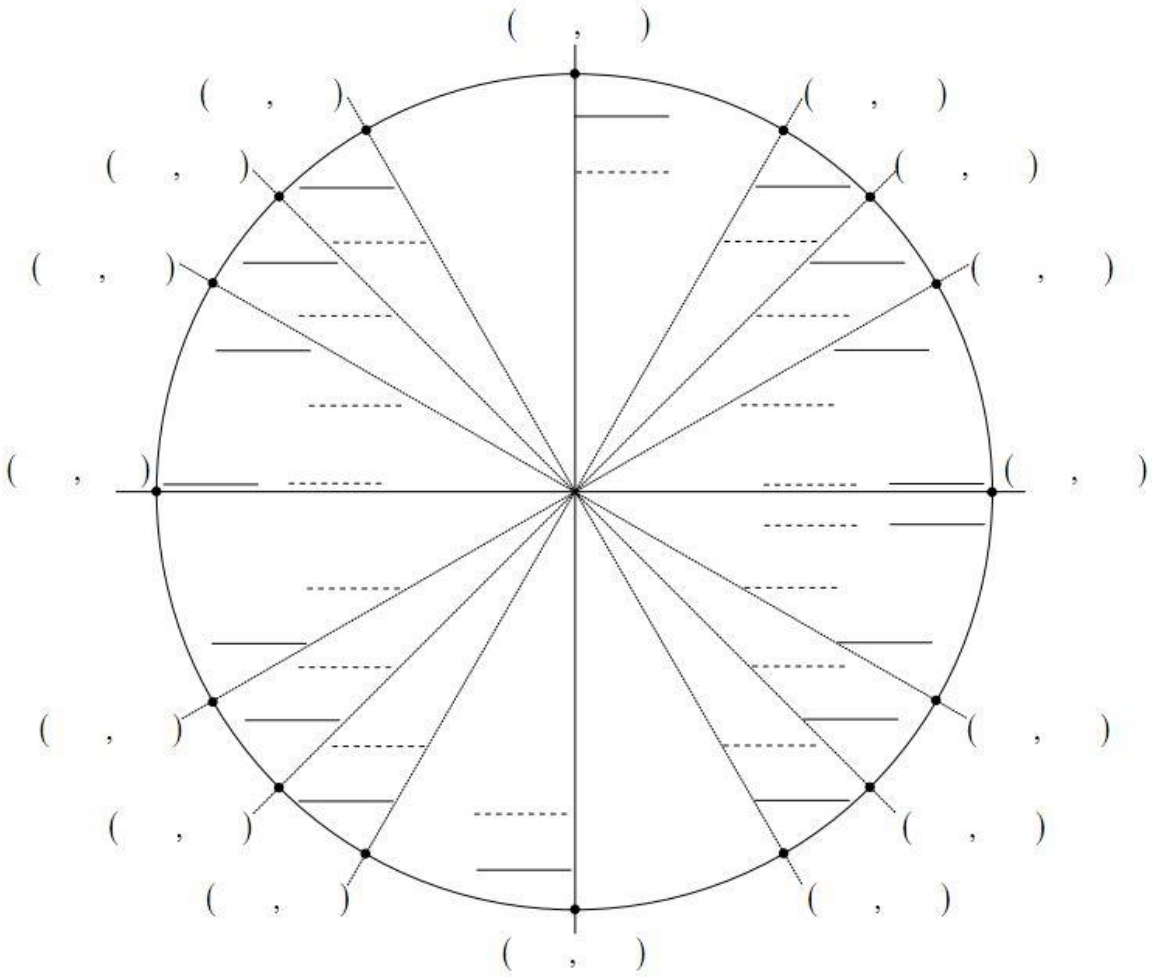
7. A tower that is 125 ft tall casts a shadow 172 ft long. Find the angle of elevation of the sun to the nearest degree.

8. Use reference angles to evaluate each trig function. Give exact values only.
   a. $\cos 225°$
   b. $\cot \frac{13\pi}{2}$
   c. $\tan 210°$
   d. $\csc \frac{7\pi}{6}$
   e. $\sin \frac{2\pi}{3}$
   f. $\sec 495°$

9. Evaluate each expression. Give exact answers only.
   a. $\sin \frac{\pi}{4} \cdot \cos 0 - \sin \frac{\pi}{6} \cdot \cos \pi$
   b. $\sin \frac{3\pi}{2} \cdot \tan\left(-\frac{8\pi}{3}\right) + \cos\left(-\frac{5\pi}{6}\right)$
   c. $\sin \frac{3\pi}{2} \cdot \tan\left(-\frac{15\pi}{4}\right) - \cos\left(-\frac{5\pi}{3}\right)$

10. On the unit circle below, label each standard angle around the circle in both radians and degrees. On the second circle, label the coordinate points on the unit circle at all standard angle locations in terms of $(\cos\theta\,, \sin\theta)$ for that angle.





11. Let $\sin t = a, \cos t = b, \tan t = c$. Rewrite each expression in terms of a, b, c.
    a. $\sin(-t) - \sin t$
    b. $\sin(t + 2\pi) - \cos(t + 4\pi) + \tan(t + \pi)$
    c. $\cos t + \cos(t + 1000\pi) - \tan(t) - \tan(t + 999\pi) - \sin t + 4\sin(t - 1000\pi)$