MATH 122
SPRING 2024 NAME:
EXAM 2

1. [10 pts.] Convert the radian measure $-\dfrac{7\pi}{20}$ to degrees.

2. [10 pts.] Convert $122°37'$ to radians, rounding to the nearest thousandth if necessary.

3. [10 pts.] Convert the radian measure 9.837 to degree-minute format, rounding to the nearest minute.

4. [10 pts.] Find the exact values of $\tan\left(\dfrac{5\pi}{6}\right)$ and $\csc\left(-\dfrac{13\pi}{3}\right)$.

5. [10 pts.] Find the length to three significant digits of the arc intercepted by a central angle $\theta = 135°$ in a circle of radius $r = 71.9$ cm.

6. [15 pts.] A gear of radius 4.80 cm drives a gear of radius 11.1 cm. If the smaller gear rotates through an angle of 438°, through how many degrees does the larger gear rotate?

7. [10 pts.] Find the measure (in radians) of the central angle of a sector of area 24 cm^2 in a circle of radius 10 cm.

8. [15 pts.] Graph $y = -3\sin\left(\frac{1}{6}x\right)$ over a one-period interval. Give the period and amplitude.

9. [15 pts.] Graph $y = 2\sin\left(\frac{1}{6}x\right)$ over a one-period interval. Give the period and amplitude. Note: the graph constructed here will be used to do Problem #10.

10. [10 pts.] Graph $y = 2\sin\left(\dfrac{1}{6}x - \dfrac{\pi}{12}\right) - 1$ over a one-period interval. Use your work and graph for Problem #9 as your starting point.

11. [10 pts.] Give the amplitude, period, vertical translation, and phase shift for the function

$$y = 7 - \frac{3}{4}\cos\left(\frac{1}{8}x + \pi\right).$$