

(1)[5 points] From a hot-air balloon 2 km high, the angles of depression to two towns in line with the balloon are  $73^\circ$  and  $47^\circ$ . How far apart are the towns? (Round your answer to one decimal place.)

(2)[5 points] Suppose  $\cos \phi = -\frac{2}{5}$  where  $\phi$  has terminal side in quadrant III. Find the exact values of the other five trigonometric functions.

(3)[5 points] Convert  $\theta = \frac{7\pi}{4}$  to degrees and show the angle  $\theta$  in standard position within the unit circle.