1. Let \( \theta = 5 \) radians.
   
   (a) (4 points) Find the quadrant in which \( \theta \) lies.
   
   (b) (6 points) Give the signs of \( \cot \theta \) and \( \csc \theta \).

2. A circular dial has 17 equally spaced marks on its edge. Find the angle between two consecutive marks:

   (a) (6 points) In degrees, minutes, seconds, to the closest second.

   (b) (4 points) In radians, rounded to 3 decimal places.

3. Let \( \theta = -\frac{8\pi}{3} \).

   (a) (2 points) Find the quadrant in which \( \theta \) lies.

   (b) (4 points) Find the exact value of \( \sin \theta \).

   (c) (4 points) Find the exact value of \( \cot \theta \).
4. Suppose that \( \tan \theta = -\frac{1}{7} \), and that \( \sin \theta < 0 \).

(a) (2 points) Find the quadrant in which \( \theta \) lies.

(b) (4 points) Find the exact value of \( \cos \theta \).

(c) (4 points) Find the exact value of \( \sin \theta \).

5. Consider the sinusoid \( y = -8 \sin \left( \frac{2\pi}{3} x - 5 \right) - 9 \). Find:

(a) (2 points) The amplitude.

(b) (4 points) The period.

(c) (4 points) The phase shift.
6. A person’s weight varies during the day. The low weight of 167# is registered at 7:00am, and the high weight of 174# is at 7:00pm. Assuming that the weight follows a sinusoid, give an equation for the weight in pounds for the 24 hours after midnight.

7. Find the exact values of:

(a) (5 points) \( \sin(\sin^{-1}\left(-\frac{\pi}{6}\right)) \).

(b) (5 points) \( \cos^{-1}(\cos\frac{10\pi}{9}) \).

(c) (10 points) \( \tan(\cos^{-1}\frac{1}{4}) \).
8. Let \( \theta = \cos^{-1} u \).

(a) (5 points) What are the possible values of \( u \) and \( \theta \)?

(b) (5 points) Without computing the value, can you determine whether \( \sin \theta \) is positive or negative?

(c) (10 points) Write an expression for \( \cot \theta \) in terms of \( u \), that does not use inverse trigonometric functions.