

# Sample Exam for Exam 1

1. Conversions.

(a) Convert  $130^\circ$  to radians.

(b) Convert  $(14, 172^\circ)$  to rectangular coordinates.

2. The radius of a circle is 40 cm. Find the central angle that subtends an arc of length 12 cm. Express your answer in radians.

3. Find the height of a tree if the angle of elevation of its top changes from  $10^\circ$  to  $14^\circ$  as the observer advances 60 ft toward its base.

4. Find the exact value for each of the following expressions.

(a)  $\cos \frac{5\pi}{6} - \cos \frac{2\pi}{4} \cos \frac{\pi}{4} =$

(b)  $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ =$

5. Find the exact values for  $\sin \alpha$  and  $\cos \alpha$  if we know that  $\tan \alpha = -\frac{7}{24}$  and  $\alpha$  is not in the fourth quadrant.

6. A satellite can be seen over the same point on Earth. It is 200 miles above the surface. Find the speed of the satellite in miles per hour. (The radius of the earth is 3960 mi).

7. Find the angle that is formed by the positive part of the  $x$ -axis and the line  $2y - 5x = -3$ .

8. Find  $a$ ,  $b$ , and  $c$  based on the picture below.

