Practice for Quiz 4: Angles

The quiz will be given on Thursday, May 2.
Math 130 *Kovitz* Spring 2019

1. (a) Convert to radian measure as a multiple of π: 75°

   (b) Convert to degree measure: $\frac{3\pi}{20}$.
   This number is in radian measure.

2. How long is an arc associated with an angle of 75° in a circle with radius 15 inches?

   Give the exact answer in inches, in terms of π. An approximate decimal answer is not required.

3. How long is an arc associated with an angle of $\frac{3\pi}{20}$ in a circle with radius 25 feet?

   Give the exact answer in feet, in terms of π. An approximate decimal answer is not required.

4. The moon is rotating at a rate of 1 revolution every 27 days. The radius is 1080 miles.

   Find

   (a) the angular speed of the moon, expressed in radians per day (fractional value of π is a preferred answer);

   (b) the linear speed of a point on the surface of the moon, in miles per hour.

   In this part, get decimal values from your calculator, with no π's in the answer.

5. A right triangle has an acute angle θ with $\csc\theta = 13/5$.

   Find the exact values of the other five trig ratios of θ.

   Leave as fractions or get approximate decimals.

Answers follow on the next page.

Answers

1. (a) $5\pi/12$ radians.

   (b) $27°$.

2. $75\pi/4 = 25\pi/4 = 6.25\pi$ inches. That is about 19.63454 inches.

   It was necessary to convert $75°$ to $75° \times \left(\frac{\pi}{180°}\right)$ radians before applying the formula $s = r\theta$.

3. $\frac{3\pi}{20} \times 25 = \frac{15\pi}{4} = 3.75\pi$ feet. That is about 11.78097 feet.

   No conversion was required; the angle was given in radian measure. Just apply the formula $s = r\theta$.

4. (a) $2\pi/27$ radians per day.

   (b) It is $\left(\dfrac{2\pi}{27}\right) 1080 = 80\pi$ miles per day.

   Dividing by 24, it becomes $\dfrac{80\pi}{24} = \dfrac{10\pi}{3} \approx 10.4720$ miles per hour.

5. $\sin\theta = \frac{5}{13}$ $\quad$ $\csc\theta = \frac{13}{5}$
   $\cos\theta = \frac{12}{13}$ $\quad$ $\sec\theta = \frac{13}{12}$
   $\tan\theta = \frac{5}{12}$ $\quad$ $\cot\theta = \frac{12}{5}$