

Welcome to Trigonometry.

My Name is Harry S. (Steve) Mills

My Phone # is 970-290-0550 - Call any time. Literally.

E-Mail Contact: In D2L, go to Classlist and click on "Steve Mills."

Class Meets at 8:15 - 9:30 am, MW. Here's the ZOOM Link:

Click here: ZOOM Link for Class.

Today:

- 1. Use Classlist for E-Mail to me. Confirm your E-Mail Settings for the course.**
- 2. Register for and use WebAssign Homework Tool and eBook.**
Use your First and Last Name as they appear in Classlist, or your records will be lost.
- 3. Access and update your grade. Download Your Personal Grade Report by Clicking Here.**
- 4. Weekly Written Assignments. Man I screwed that up, today!!!**
Find them, work them, and upload a single-file PDF.
Find your graded work. (Go to the assignment on D2L and download your graded work.)
NAME your assignment: LastnameMiddleInitial-wk1, LastnameMiddleInitial-wk2, etc., e.g., "SmithJ-wk1"
- 5. Written Midterm and Final**
Midterm: March 11th, in a location to be determined.
Final: May 11th, in a location to be determined.
- 6. harryzaims.com**
Find it and learn what's there:
Homework Videos and Notes for WebAssign exercises, Old Midterms and Finals, Every day's lecture video and lecture notes, Syllabus, Schedule, and more...
- 7. Section 1.1 Discussion?**

Weekly Written Work:

This is where most of the growth typically occurs. It's where you put together the basic skills from WebAssign and learn to communicate the mathematics in writing.

1. You will convert your written work to a PDF to be uploaded to the dropbox for the Assignment on D2L. I will upload the graded work as an attachment to the same place.

2. Black writing against a white background.

Practice on whatever paper you wish. For the work you turn in, however, it must be plain white background. No college-ruled paper.

3. There's more than one way to achieve good PDFs of your work:

CamScanner app for paper-and-pencil work works pretty good.

A good printer-scanner can do it.

A pen tablet can create good copy, as well. This might be best, at least for the final version that you turn in. I think you still want to use lots of looseleaf paper and spread out on the desk or table where you do math homework.

4. Arrange Exercises *vertically!*

#2 goes below #1

#3 goes below #2

.....

5. Leave a 1-inch left margin. This is where I put the points earned for each exercise.

6. Leave plenty of white space for grader comments.

Written work is as much formative as summative. If your work is cramped, I can't make helpful comments, and may not grade it at all.

7. Provide the context of the question, so that your work is a brief, complete report on the entire assignment. For instance, "#s 1 - 5 Find the equation of the line through the given points." Then for #s 1 - 5, write the two points, e.g. (5, 2), (3, - 6). "Context" is typically 1 out of 5 points for a typical 5-pointer.

8. Circle final answers.

9. Put a line through errors rather than erasing them. This saves time and may also earn more points, if I can make out something you got right, but changed your mind about.

10. For *word* problems, include a *lexicon* that defines the variables used in words and provides the units used. For instance, "Let x = the number of tickets sold," or "Let r = the radius of the circle, in centimeters," or "Let r = the radius of the circle (cm)." This is typically 1 out of 5 points for a typical 5-pointer.

11. Supporting work is always required. An answer sheet without supporting work will receive a '0.'

12. When you save your work in PDF format, give it a name that has your name in it:

MillsH-wk1.pdf

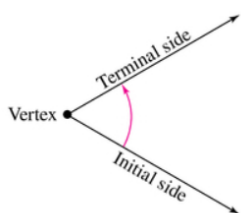
SmithJ-wk1.pdf

etc.

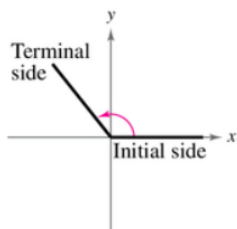
Section 1.1 - Radian and Degree Measure

1.1. Radian and Degree Measure

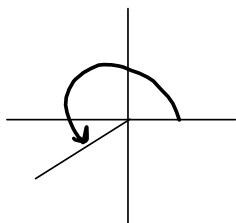
- Describe angles.
- Use radian measure.
- Use degree measure.
- Use angles and their measure to model and solve real-life problems.



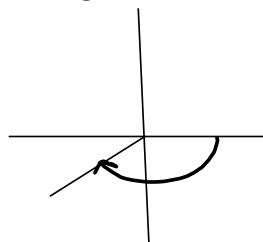
Angle in standard position.



Positive measure



Negative measure



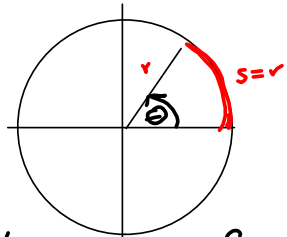
The *measure* of an angle reports the amount of rotation.

Two standard measures:

Degrees and Radians

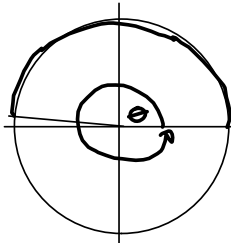
1 degree is 1/360th of a full revolution, i.e., 360 degrees to go full circle.

1 radian is the measure of the angle corresponding to an arc length equal to the radius of the circle.



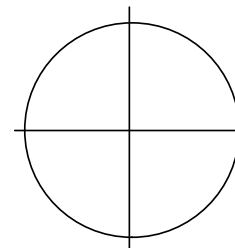
$\theta = \text{"theta"}$
 $\theta = 1$ when $s = r$

How many radians to go full circle?
 What's the circumference of a circle of radius r ?



- $s = 1r \Rightarrow \theta = 1$
- $s = 2r \Rightarrow \theta = 2$
- $s = 3r \Rightarrow \theta = 3$
- $s = 4r \Rightarrow \theta = 4$
- $s = 2\pi r \Rightarrow \theta = ?$

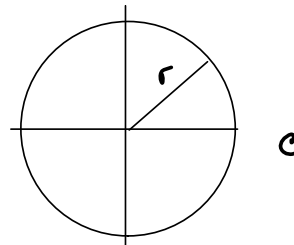
Radians:



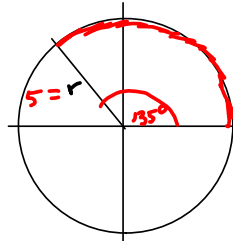
2π radians to go full circle

Circumference of a circle. = $2\pi r$

$2\pi = 360^\circ$?!
 $\frac{2\pi}{\pi} = \frac{2\pi r}{\pi r}$
 $\frac{360^\circ}{180^\circ} = \frac{360^\circ}{90^\circ}$



Arc length s corresponding to an angle theta on a circle of radius r .



Radians relate angles to arc length.

$s = r\theta$ if θ is in radians.

$r = 5, \theta = 135^\circ$

$s = r\theta = (5 \cdot 135^\circ) \left(\frac{\pi}{180^\circ} \right) = 5 \cdot \frac{3\pi}{4}$

~~Bad!~~
 $= \frac{15\pi}{4} \approx \frac{15 \cdot 6.28}{4}$

Don't use rounded figures in calculations

≈ 11.780972451

$$2\pi = 360^\circ$$

$$\frac{2\pi}{360^\circ} = \frac{\pi}{180^\circ} = 1 \quad !$$

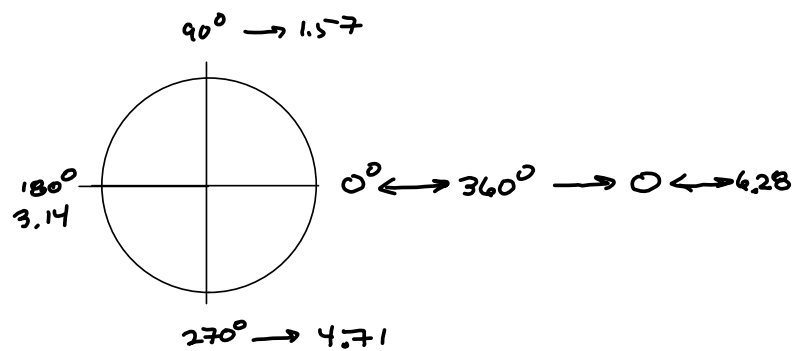
$$(30^\circ) \left(\frac{\pi}{180^\circ} \right) = \frac{\pi}{6}$$

$$(45^\circ) \left(\frac{\pi}{180^\circ} \right) = \frac{\pi}{4}$$

$$(60^\circ) () = \frac{\pi}{3}$$

$$(90^\circ) () = \frac{\pi}{2}$$

what's the arc length

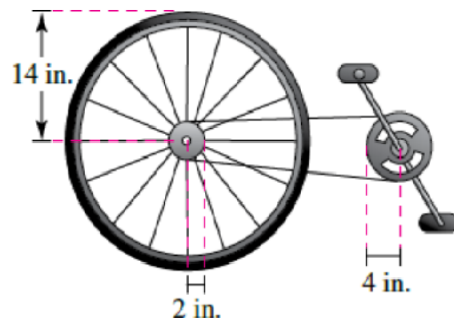


Area of a Circle

Area of a Sector of a Circle corresponding to an angle

Angular velocity - The rate at which the angle is changing with respect to time.

The radii of the pedal sprocket, the wheel sprocket, and the wheel of the bicycle in the figure are 4 inches, 2 inches, and 14 inches, respectively. A cyclist pedals at a rate of 1 revolution per second.



(a) Find the speed of the bicycle in feet per second and miles per hour.

$$\left(\frac{1 \text{ revolution front sprocket}}{\text{sec}} \right) \left(\frac{4 \text{ revolutions rear sprocket}}{2 \text{ revolutions front sprocket}} \right) \left(\frac{2\pi \text{ radians}}{1 \text{ revolution rear}} \right) \left(\frac{14 \text{ inches rear}}{\text{wheel}} \right)$$

(b) Use your result from part (a) to write a function for the distance d (in miles) a cyclist travels in terms of the number n of revolutions of the pedal sprocket.

(c) Write a function for the distance d (in miles) a cyclist travels in terms of the time t (in seconds).

Compare this function with the function from part (b).

The function from (b) is

The function from (c) is