

Objective: Describe angles using radian and degree measures

Tuesday 3/31

Radian and Degree Measure

- What is a radian?
- Radians and degrees
- Sketching an angle in radians

Objective: Describe angles using radian and degree measures

Watch: Khan Academy Intro to Radians

<https://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/intro-to-radians-trig/v/introduction-to-radians?modal=1>

Please watch the video on Khan academy that introduces radians before proceeding with the power point.

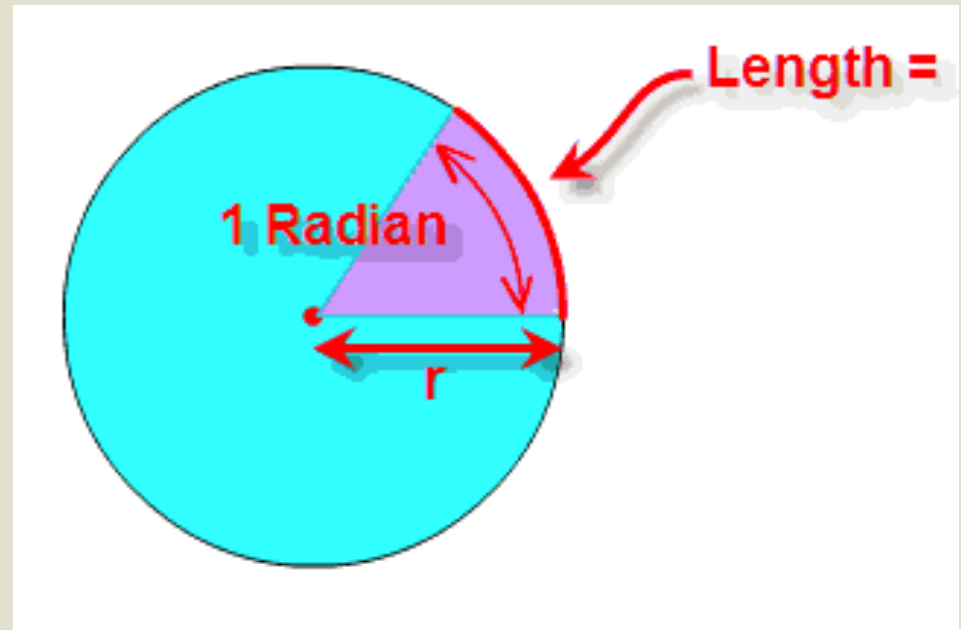
Objective: Describe angles using radian and degree measures

What is a radian?

A radian is the measure of an angle that is formed if the length of one radius is wrapped around the circle.

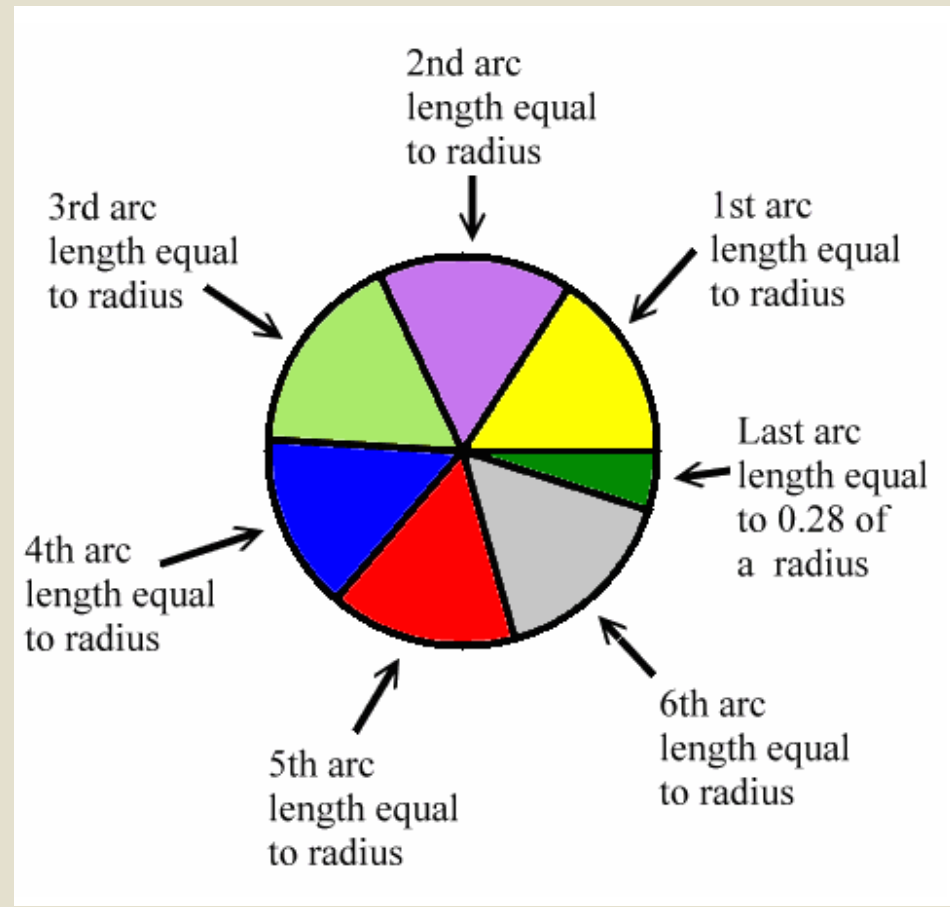
The red arc around part of the circle is the length of the radius of that same circle.

The pink angle that is formed is equal to one radian.



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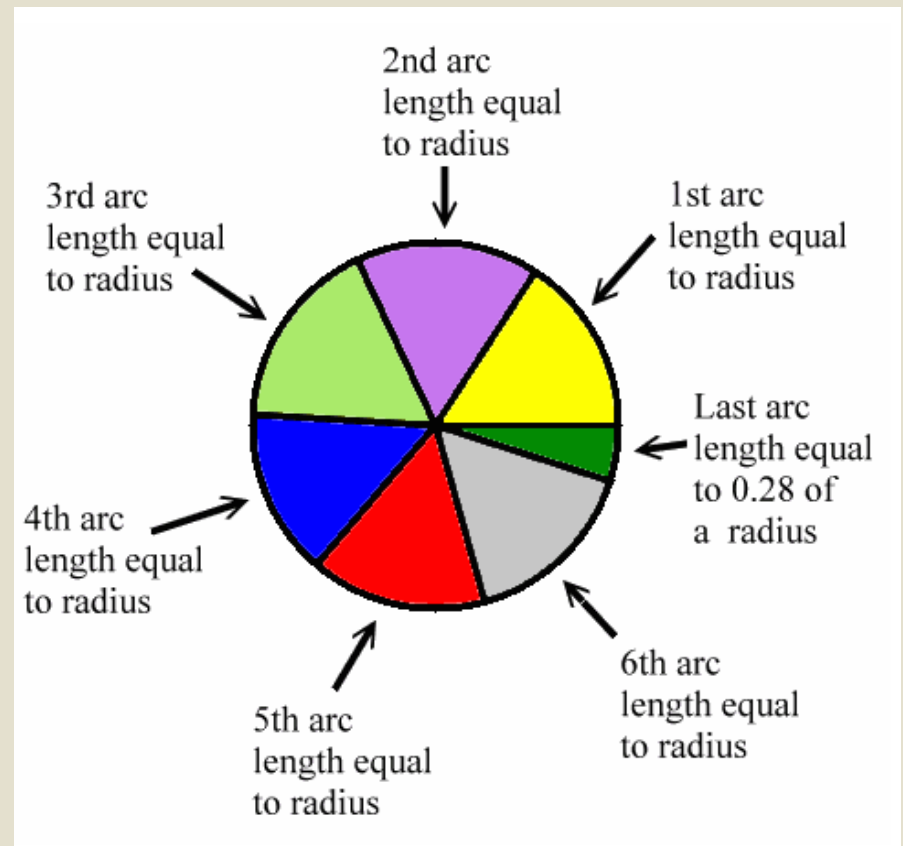
If we repeat this by wrapping the length of the radius around the circle until we get all the way around we can see that there are 6 full radius lengths and a little section left over (labeled here as 0.28 of a radius).



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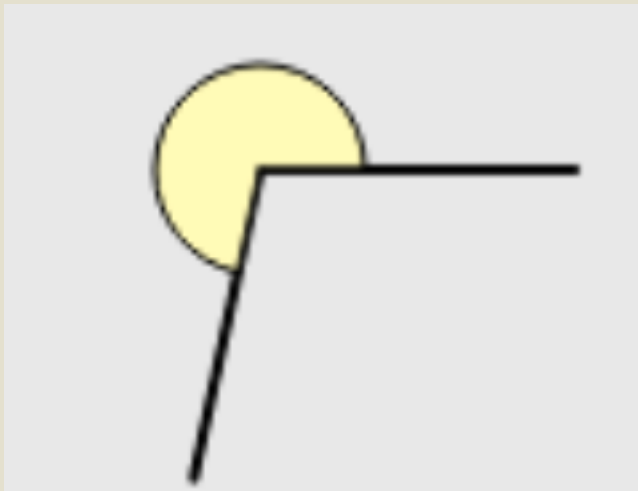
Why are there 6 radius lengths and a little bit?

The circumference of a circle is calculated by $C = 2\pi r$, which means 2π times the radius of the circle. $2\pi = 6.28\dots$ So that is why we have 6 full radius lengths with a small part left over.



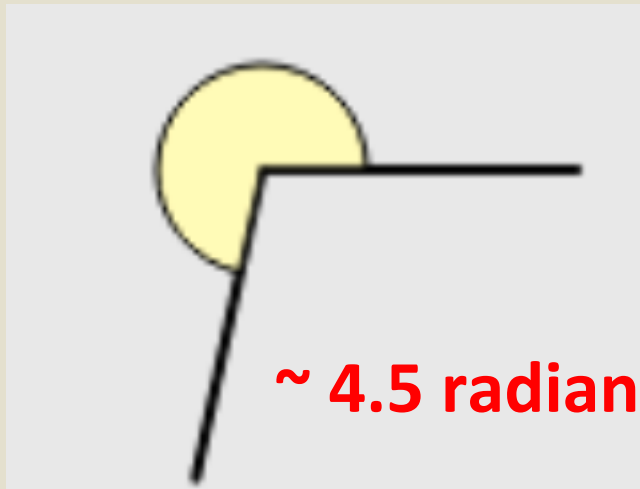
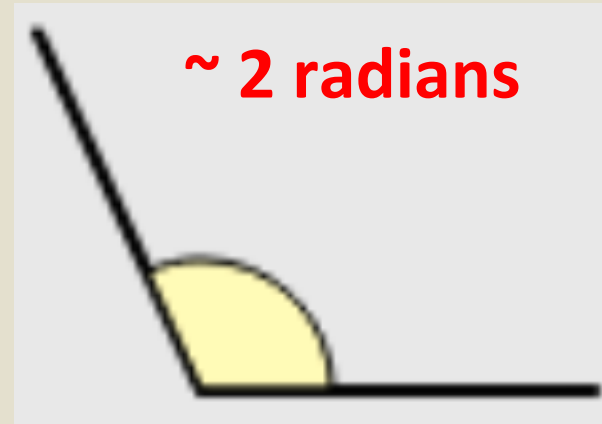
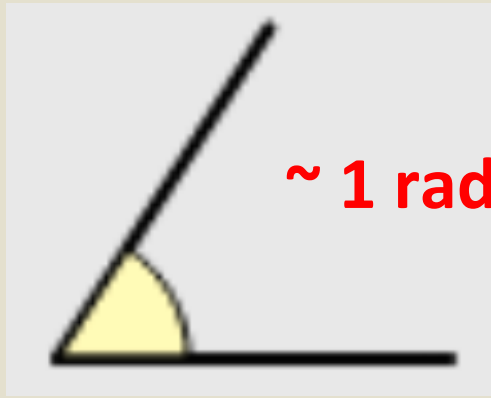
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Estimate the angle to the nearest one-half radian



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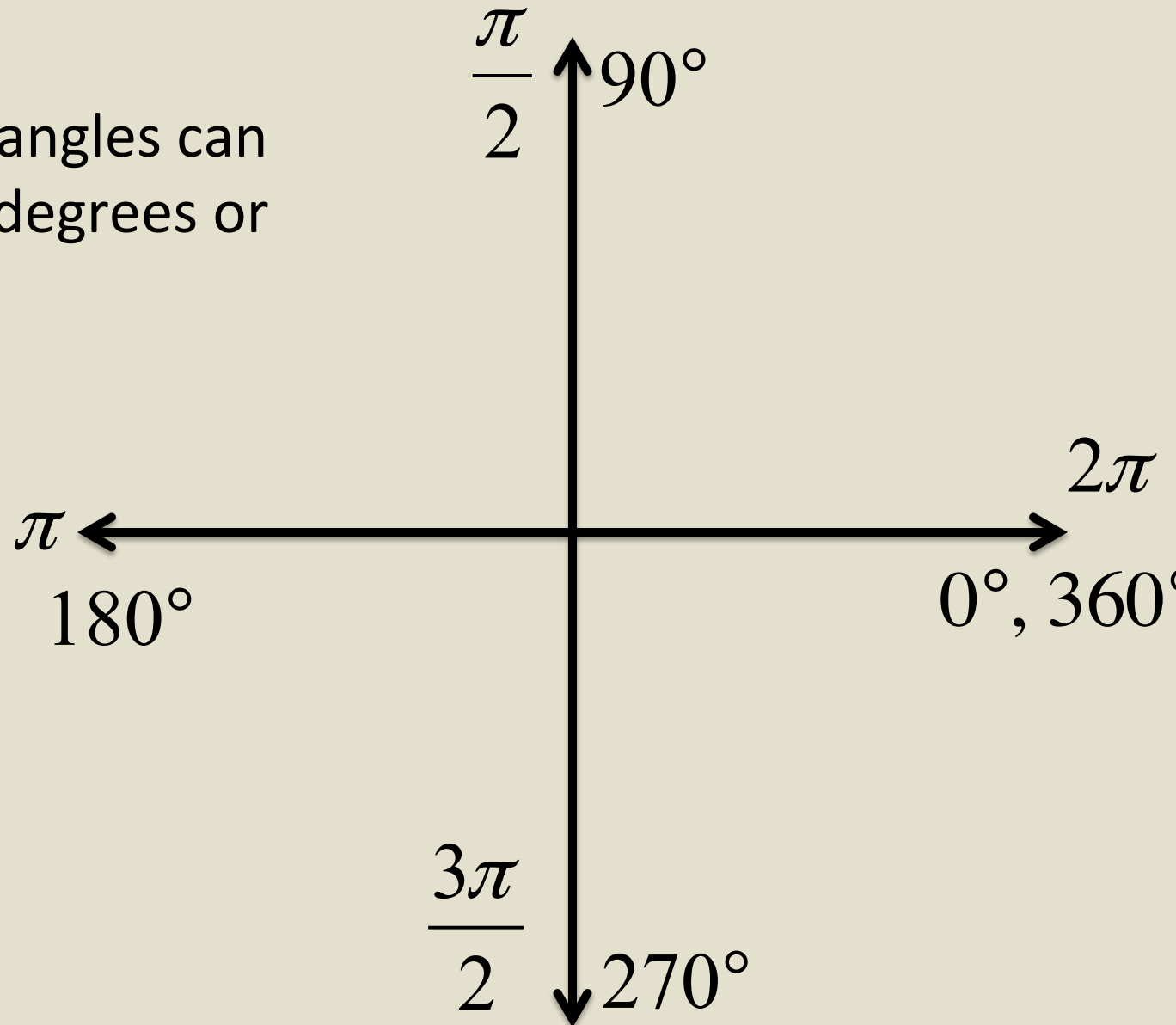
Estimate the angle to the nearest one-half radian



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The Unit Circle

Remember that angles can be expressed in degrees or radians.



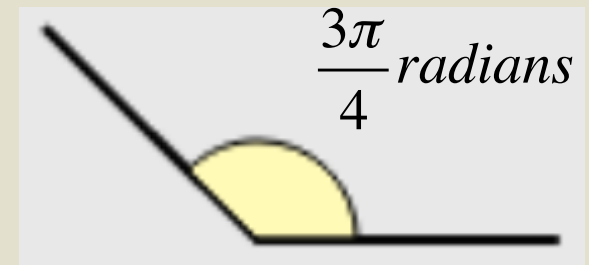
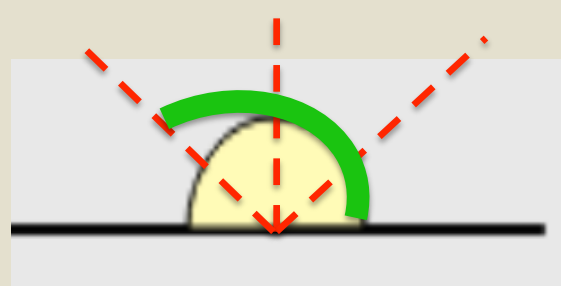
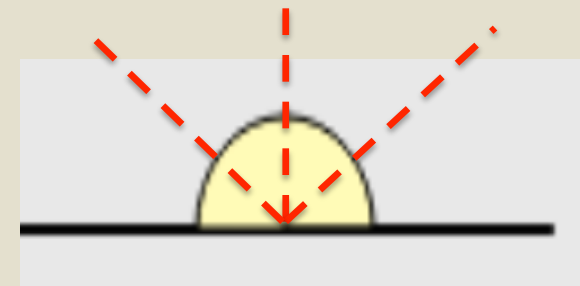
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Sketching Angles in Radians

A full circle is a rotation of 2π . So we want to think of our circle in terms of 1π . How much is that? Sketch that angle first:



If we want to sketch $\alpha = \frac{3}{4}\pi$ we know we want $\frac{3}{4}$ of π . So we need to visually divide that angle above (which is 1π) into 4 parts. We then select 3 of the 4 parts to get $\frac{3}{4}\pi$.



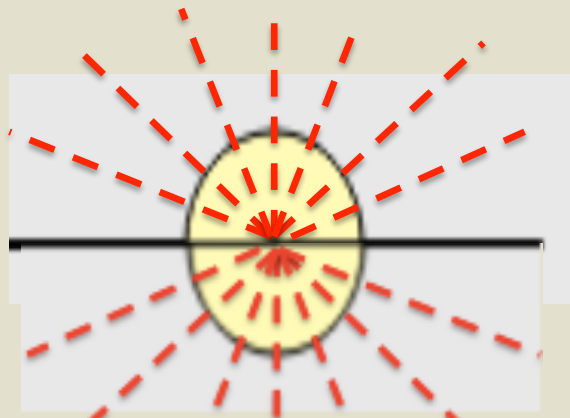
$$\frac{3\pi}{4} \text{ radians}$$

Objective: Describe angles using radian and degree measures

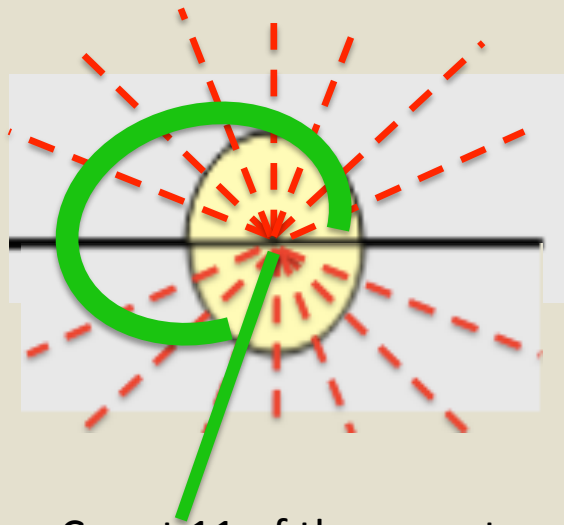
Sketching Angles in Radians

Let's try another one:

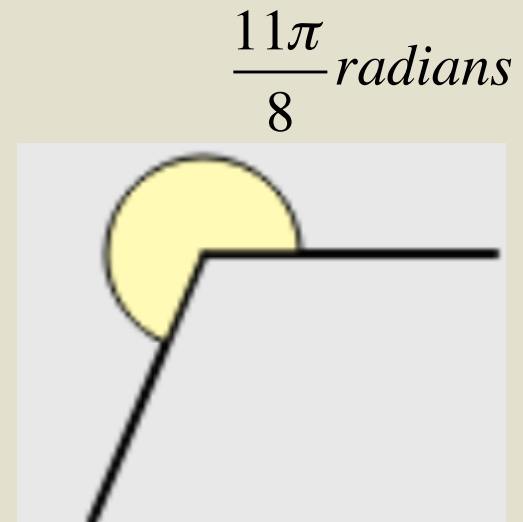
Sketch $\alpha = 11/8 \pi$ we know we want 1π and $3/8\pi$. So we will use the full quadrant I and II, which make 1π and then we need $3/8$ more π .



1st: divide each 1π into 8 parts (the denominator of the angle we want to sketch)



Count 11 of those parts



$$\frac{11\pi}{8} \text{ radians}$$

Objective: Describe angles using radian and degree measures

Sketch each angle and determine the quadrant in which it lies.

1. $\frac{7\pi}{4}$

2. $\frac{-9\pi}{8}$

3. 3 radians

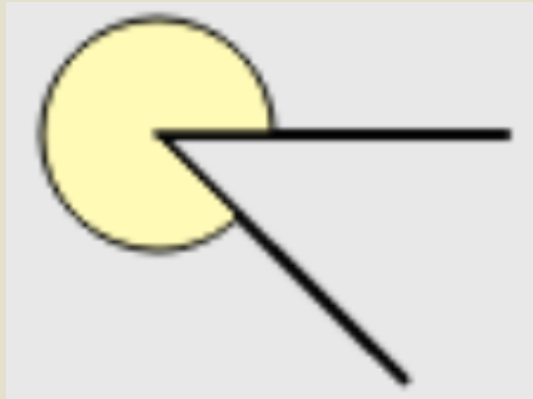
4. -2 radians

Objective: Describe angles using radian and degree measures

Sketch each angle and determine the quadrant in which it lies.

Quadrant IV

1. $\frac{7\pi}{4}$



Quadrant II

2. $-\frac{9\pi}{8}$

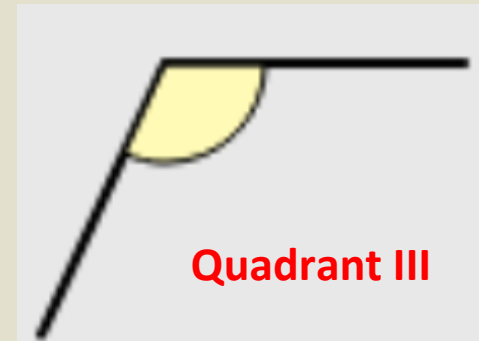


3. 3 radians



Quadrant II

4. -2 radians



Quadrant III

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Assignment:

Log in to Office 365

Complete the assignment:

Angles In Radians (Week 1, Day 2)
(posted in Teams)