

Aim: How do we express a trig function as a function of a positive acute angle?

OCW:

1. Finish worksheet
- 2.

Agenda:

1. Get Ready
2. Mini-lesson
3. Activity
4. Wrap up

Get Ready:

$$\frac{\pi}{4} = 45^\circ$$

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

I. Convert from degrees to radians

a.  $135^\circ \cdot \frac{\pi R}{180^\circ} = \frac{135\pi}{180} = \frac{3\pi}{4}$       b.  $300^\circ \cdot \frac{\pi R}{180^\circ} = \frac{300\pi}{180} = \frac{5\pi}{3}$       c.  $100^\circ \cdot \frac{\pi R}{180} = \frac{5\pi}{9}$

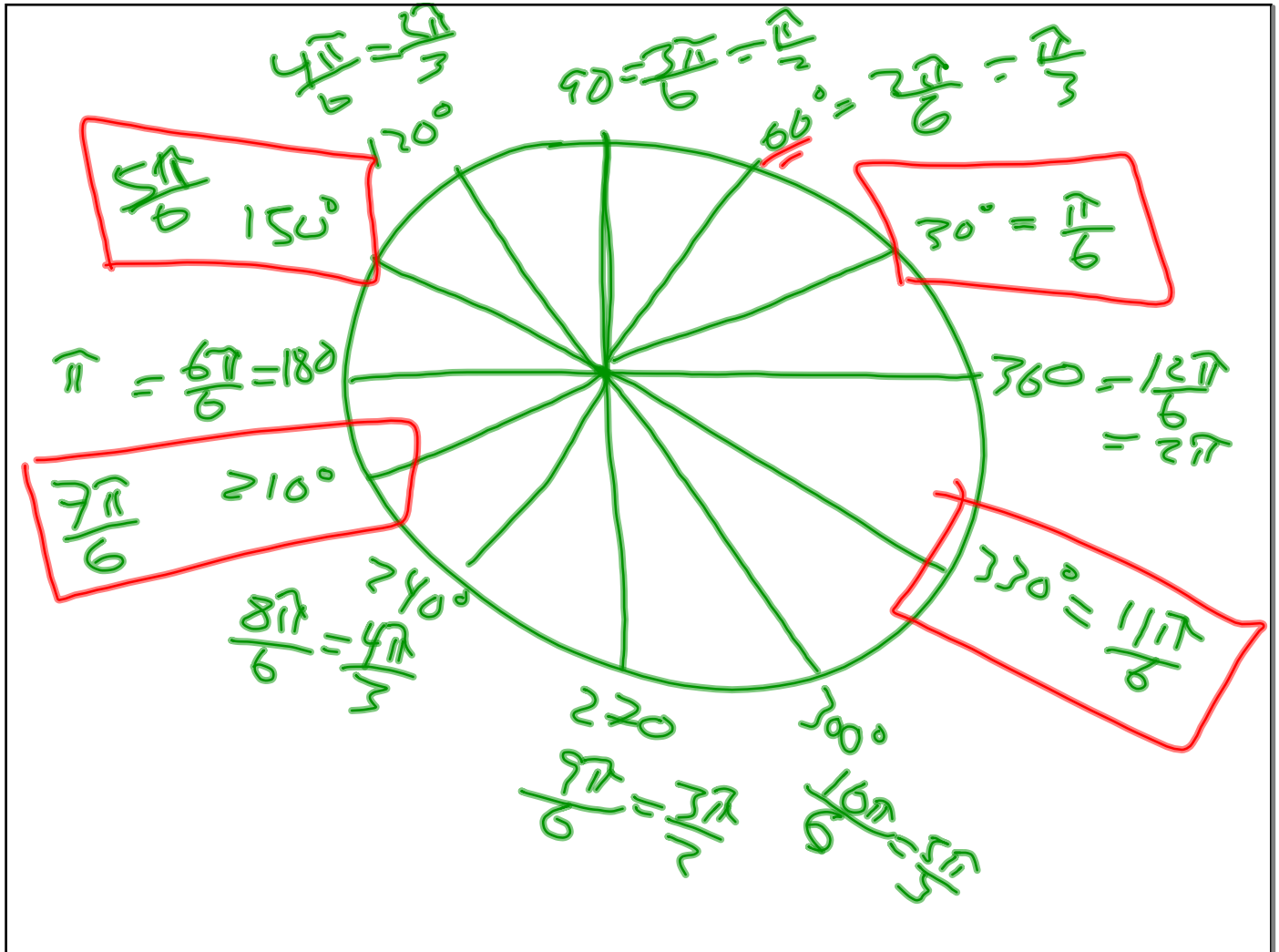
II. Convert from radians to degrees

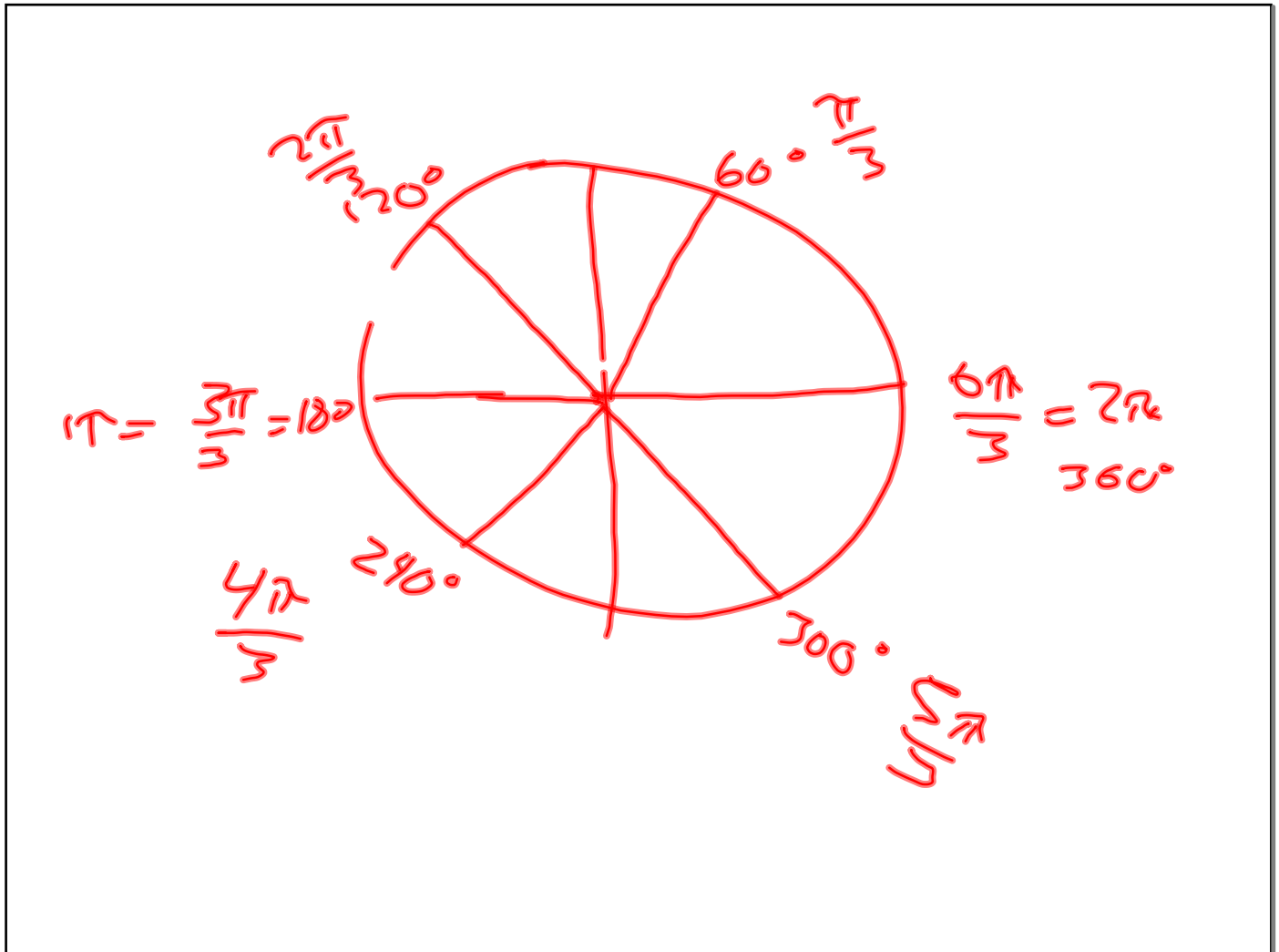
a.  $\frac{5\pi}{3} R \cdot \frac{180^\circ}{\pi R} = \frac{500}{3} = 300^\circ$       b.  $\frac{11\pi}{6} \cdot \frac{180^\circ}{\pi} = -330^\circ$       c.  $4 \cdot \frac{180^\circ}{\pi} = \frac{4(180)}{\pi}$

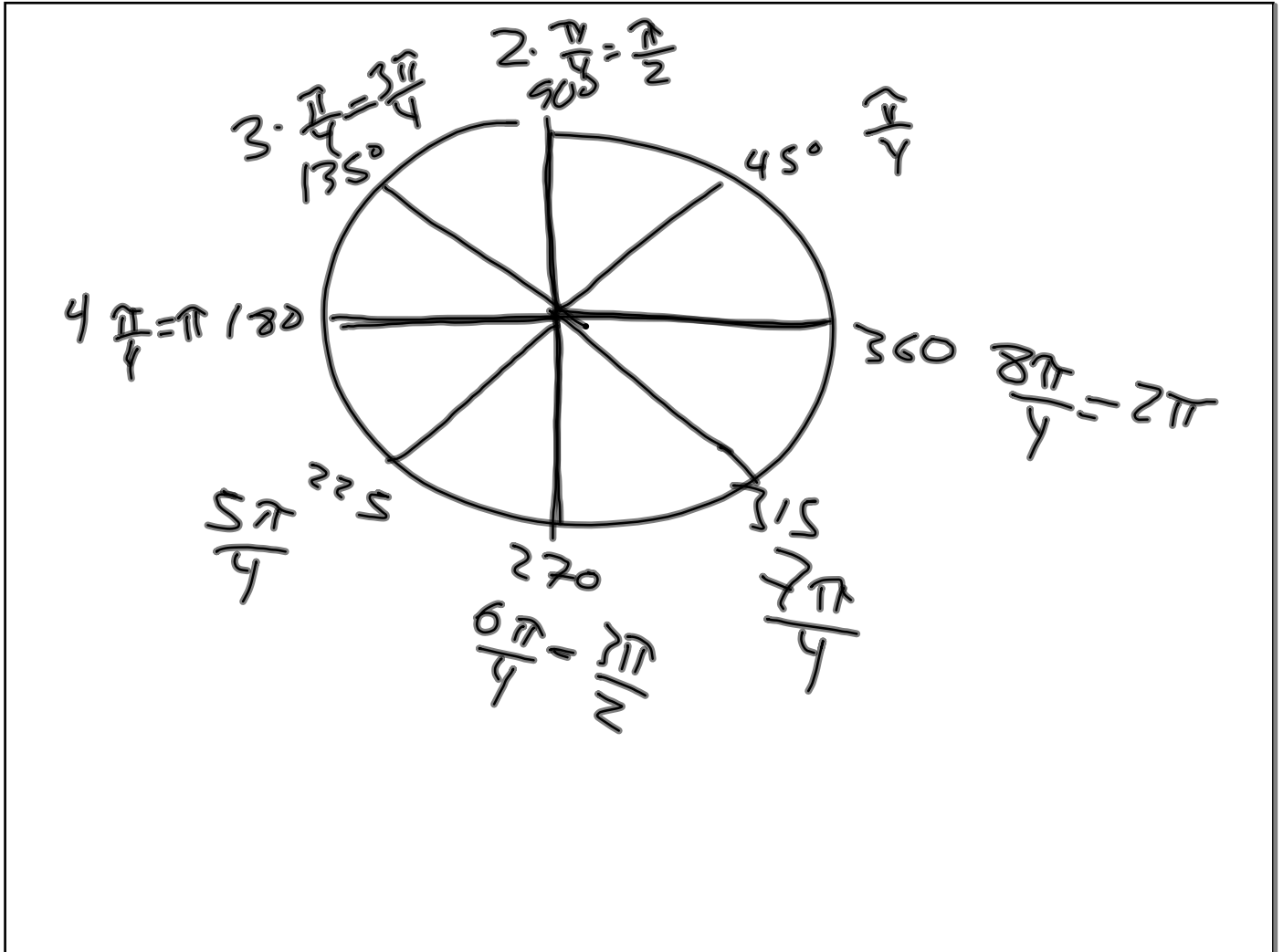
The image displays the TI-SmartView software interface for a TI-84 Plus calculator. The interface is divided into several sections:

- Calculator View (Left):** Shows the TI-84 Plus Silver Edition calculator screen with the following display:  
 $4 * 180$                       720  
Ans/π                      229.1831181
- Equation Editor (Top Middle):** Shows the equation  $Y1 = -X^2 + 6X - 2$ .
- Window Settings (Middle Middle):** Lists the following window parameters:  
WINDOW  
Xmin=-.1  
Xmax=6.1  
Xscl=1  
Ymin=-1  
Ymax=10  
Yscl=1  
Xres=1
- Graph (Bottom Middle):** Displays a graph of the parabola  $Y = -X^2 + 6X - 2$ .
- Key Press History (Right):** Shows a large screen with the following text:  
4\*180  
720  
Ans/π  
229.1831181

The interface also includes a menu bar (File, Edit, View, Tools, Scripts, Help), a toolbar, and a dock at the bottom with various application icons.







3.14  $\approx$   $\pi$



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*reference*

III. Find the reference angle in degrees. Then convert your answer to radians.

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

a.  $\frac{5\pi}{4} = 225^\circ$

b.  $\frac{-7\pi}{6} = -210^\circ$

c.  $\frac{4\pi}{3} = 240^\circ$

$$\frac{\pi}{4} = 45^\circ$$

$$\frac{\pi}{6} = 30^\circ$$

Q II

Q III

$$\text{Ref } \angle = 225 - 180 = 45^\circ$$

$$\begin{array}{r} -210^\circ \\ +360^\circ \\ \hline 150^\circ \end{array}$$

Q II

$$\text{Ref } \angle = 180 - 150 = 30^\circ$$

$$\begin{array}{r} \text{Ref } \angle = 240 \\ -180 \\ \hline 60^\circ \end{array}$$

Aim: How do we express a trig function as a function of a positive acute angle?

**Functions of a Positive Acute Angle**

- i) find reference angle
- ii) find sign of function in that quadrant
- iii) express as function of reference angle

1)  $\sin\left(\frac{3\pi}{4}\right) = \sin 135^\circ = \sin 45^\circ$       2)  $\cos\left(\frac{2\pi}{3}\right)$

① ② II  
 ② Ref  $\angle = 180 - 135 = 45^\circ$   
 ③

3)  $\tan\left(\frac{5\pi}{6}\right)$       4)  $\sin\left(\frac{7\pi}{6}\right)$

**Aim: How do we express a trig function as a function of a positive acute angle?**

**Functions of a Positive Acute Angle**

i) find reference angle reference

ii) find sign of function in that quadrant

iii) express as function of reference angle

1)  $\sin\left(\frac{3\pi}{4}\right) = \sin 135^\circ = \sin 45^\circ$

① Q II  
② Ref  $\alpha = 180 - 135 = 45^\circ$   
③  $\sin \theta > 0$

2)  $\cos\left(\frac{2\pi}{3}\right) = \cos 120^\circ = -\cos 60^\circ$


① Q II  
② Ref  $\alpha = 180 - 120 = 60^\circ$   
③  $\cos \theta < 0$   
Cos is negative


3)  $\tan\left(\frac{5\pi}{6}\right)$

4)  $\sin\left(\frac{7\pi}{6}\right)$

[Extend Page](#)

Groups

5  Jan 23-11:18 AM

6  Jan 23-11:31 AM

Mini lesson

Mini lesson

Mini lesson

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5)  $\cos\left(\frac{5\pi}{4}\right)$

6)  $\tan\left(\frac{10\pi}{9}\right)$

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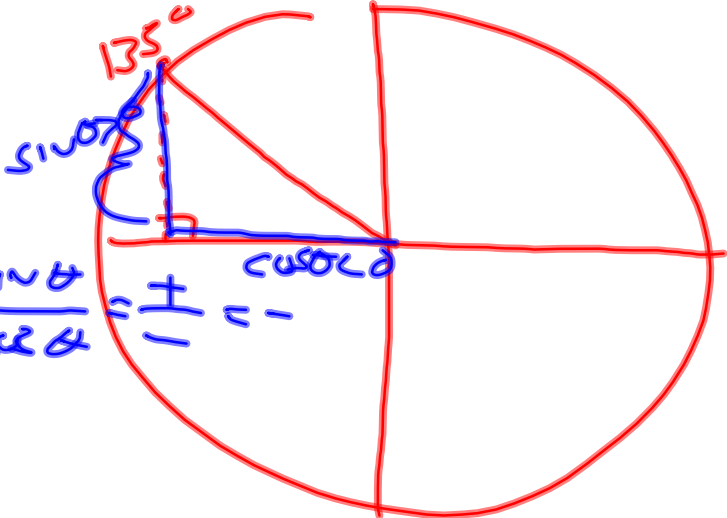
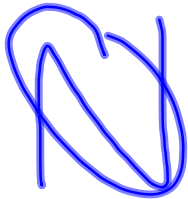
$$7) \sin\left(\frac{29\pi}{18}\right)$$

$$8) \cos\left(\frac{65\pi}{35}\right)$$

$$9) \tan\left(\frac{61\pi}{36}\right)$$

$$10) \sin\left(\frac{37\pi}{12}\right)$$





$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{+}{-} = -$$

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15)  $\sin\left(\frac{11\pi}{9}\right)$

16)  $\sin\left(\frac{23\pi}{36}\right)$

17)  $\sin\left(\frac{5\pi}{3}\right)$

18)  $\sin\left(-\frac{\pi}{4}\right)$

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$$19) \sin\left(\frac{49\pi}{16}\right)$$

$$20) \sin\left(\frac{-55\pi}{18}\right)$$

$$21) \cos\left(\frac{3\pi}{4}\right)$$

$$22) \cos\left(\frac{5\pi}{4}\right)$$

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23)  $\cos\left(\frac{5\pi}{3}\right)$

24)  $\cos\left(-\frac{\pi}{6}\right)$

25)  $\tan\left(\frac{5\pi}{4}\right)$

26)  $\tan\left(\frac{3\pi}{4}\right)$

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27)  $\tan\left(\frac{5\pi}{3}\right)$

28)  $\tan\left(-\frac{5\pi}{3}\right)$

29)  $\tan\left(-\frac{3\pi}{4}\right)$

30)  $\sin\left(\frac{5\pi}{4}\right)$

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31)  $\cos\left(\frac{5\pi}{4}\right)$

32)  $\tan\left(\frac{5\pi}{4}\right)$

33)  $\sin\left(\frac{25\pi}{36}\right)$

34)  $\cos\left(\frac{25\pi}{36}\right)$

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35)  $\tan\left(\frac{25\pi}{36}\right)$

36)  $\sin\left(\frac{5\pi}{3}\right)$

37)  $\cos\left(\frac{5\pi}{3}\right)$

38)  $\sin\left(-\frac{3\pi}{4}\right)$