4.1 Radian and Degree Measure

Copy the information below

	30° $(\pi/6)$	60° $(\pi/3)$	45° $(\pi/4)$
sin	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$
tan	$\frac{1}{\sqrt{3}}$	$\sqrt{3}$	1

$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

MEMORIZE !!!

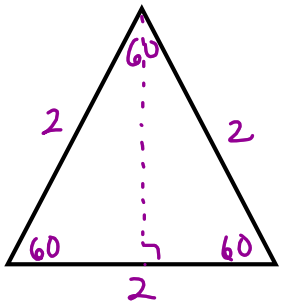
Jan 7-5:08 PM

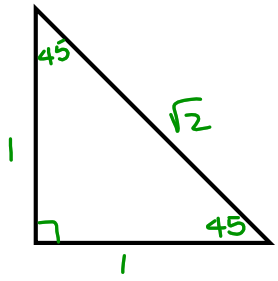
4.1 -Radian and Degree Measure - part 1

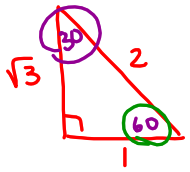
- Trig Ratios
- Standard Position
- Radians
- What Quadrant am I in?

- Co-terminal Angles
- Complementary and Supplementary Angles
- Conversions
- Degrees Minutes Seconds (DMS) on Calculator

Where do those ratios come from????







SOH CAH TOA

$\sin 30 = \frac{1}{2}$ $\sin 60 = \frac{\sqrt{3}}{2}$

$\cos 30 = \frac{\sqrt{3}}{2}$ $\cos 60 = \frac{1}{2}$

$\tan 30 = \frac{1}{\sqrt{3}}$ $\tan 60 = \sqrt{3}$

$\sin 45 = \frac{1}{\sqrt{2}}$

$\cos 45 = \frac{1}{\sqrt{2}}$

$\tan 45 = 1$

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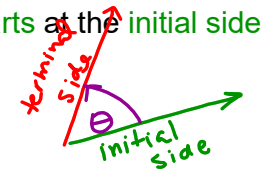
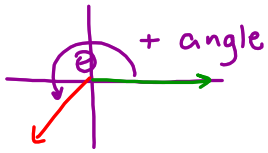
An angle starts at the initial side and ends at the terminal side.



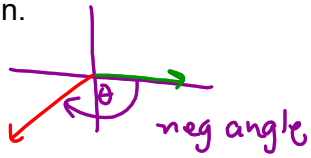
θ = theta

An angle is said to be in standard position when the initial side is on the positive x-axis.



A positive angle in standard position starts on the x-axis and moves in a counter-clockwise direction.

A negative angle in standard position starts on the x-axis and moves in a clockwise direction.



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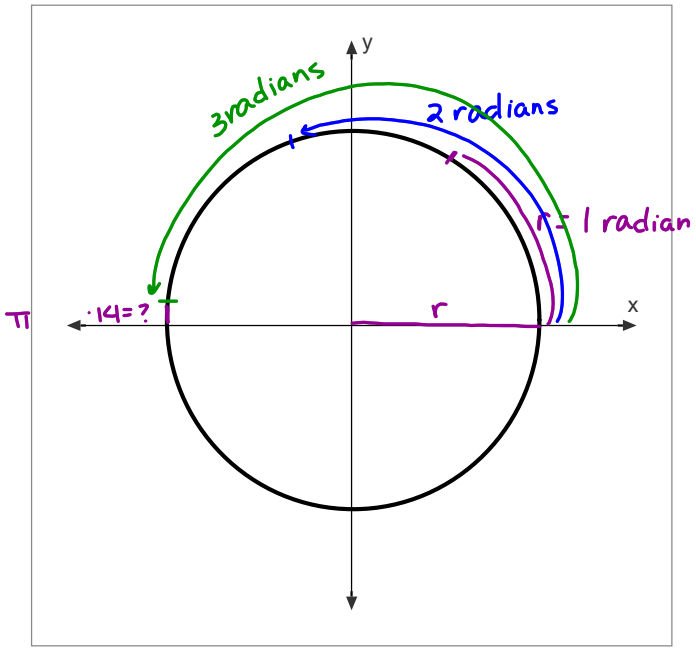
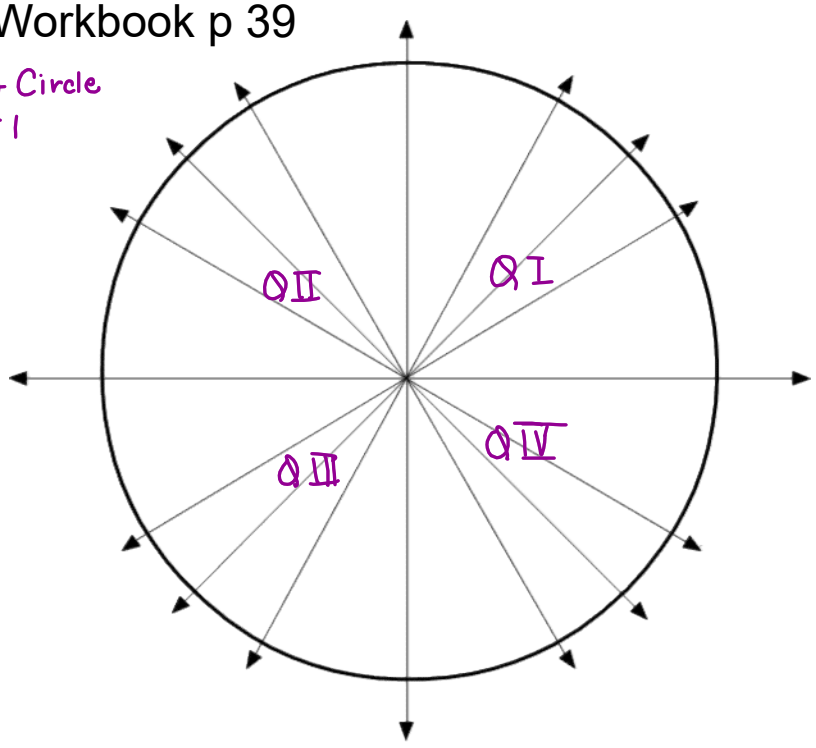
Radian measure - the length of the radius as an arc on the circle



Nov 21-9:19 AM

Workbook p 39

Unit Circle
r = 1



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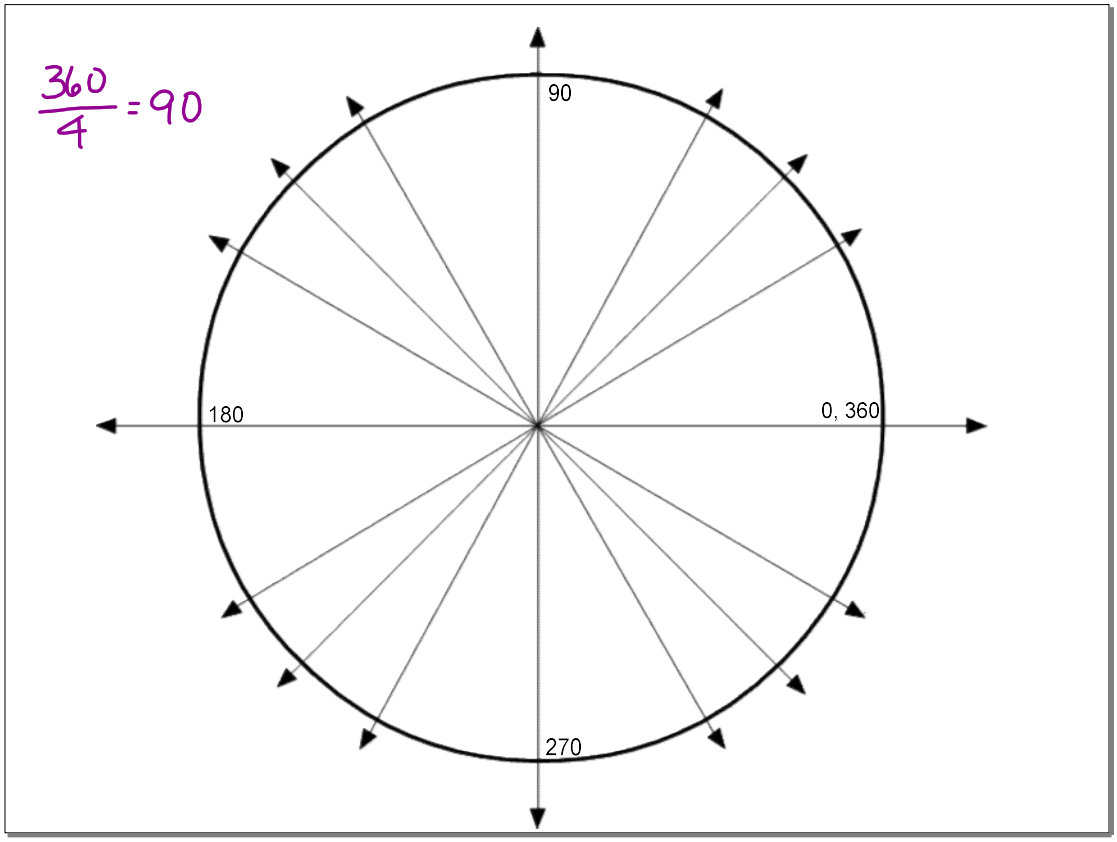

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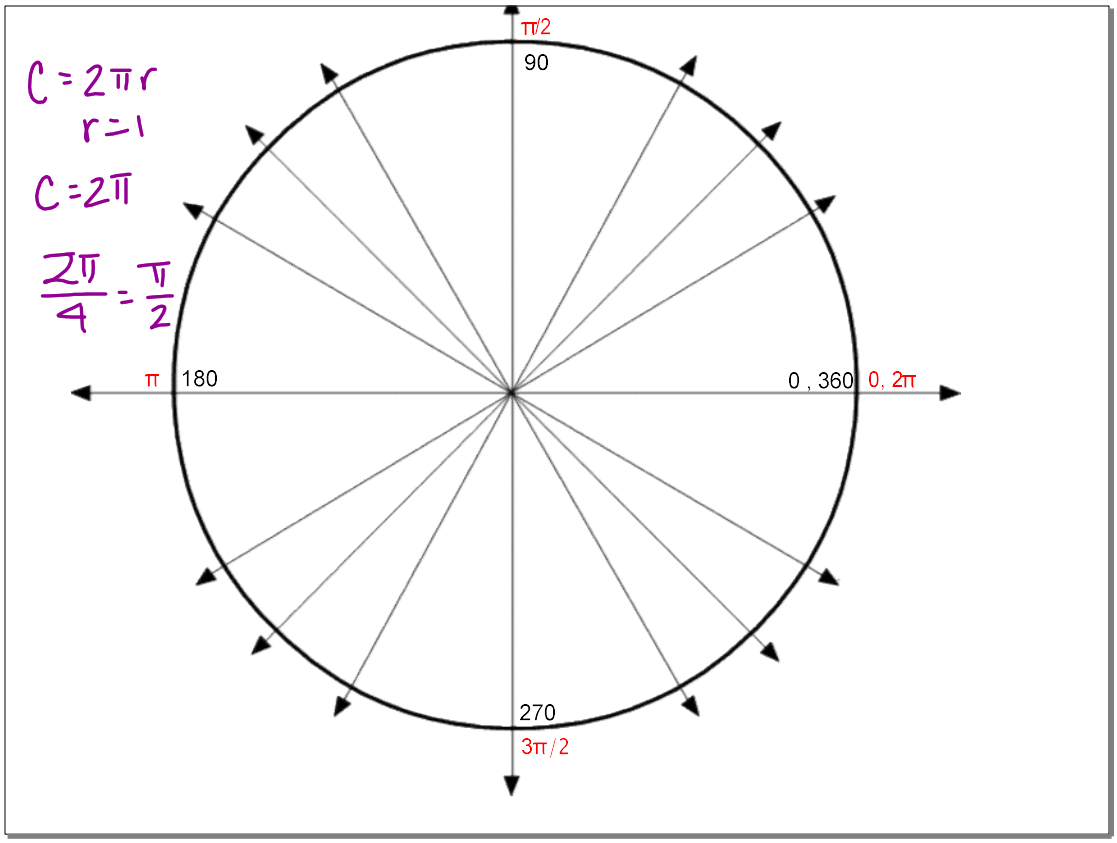

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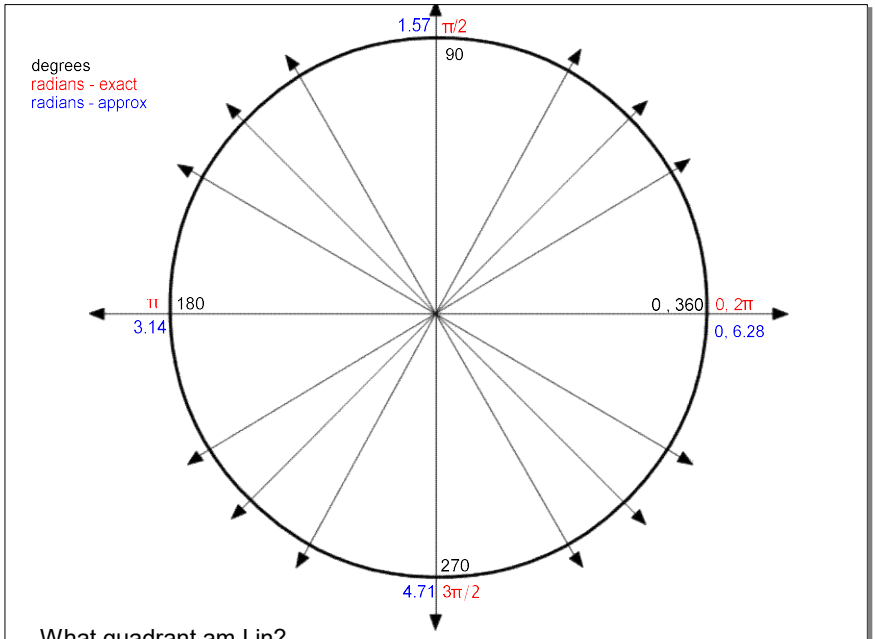
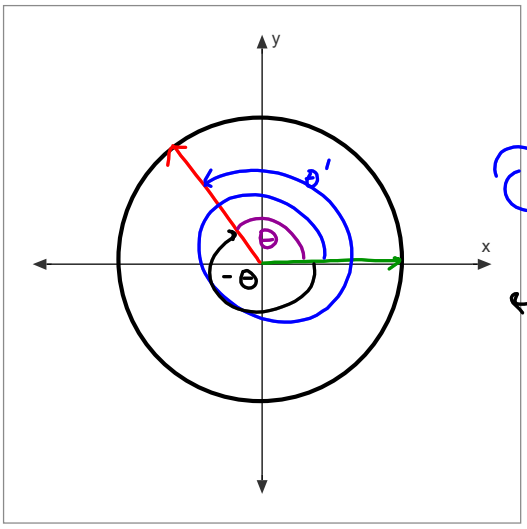


What quadrant am I in?

1. $235°$ III
2. 3 II
$-89°$ IV
3. $\frac{1\pi}{6}$ I
$\frac{5\pi}{3}$ IV
$-\frac{5\pi}{4}$ II
$-\frac{5\pi}{6}$ III
-4 II
$\frac{3\pi}{7}$ I
$480°$ I

Jan 7-5:19 PM

Coterminal Angles: Angles that share initial and terminal sides



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Find one positive and one negative coterminal angle for: + or - 360°, 2π, 6.28

337°

+ COTA 360 → 697

− COTA 337 − 360 ⇒ 360 − 337 → −23

$\frac{5\pi}{6}$ + 2π

$\frac{5\pi}{6} + \frac{12\pi}{6} = \frac{17\pi}{6}$

$\frac{5\pi}{6} - \frac{12\pi}{6} = \frac{-7\pi}{6}$

2.3

+6.28 → 8.58

2.3 − 6.28 → −3.98

−405°

✗ COTA + 360 → −45

− COTA

+ COTA + 360 → 315

$-\frac{5\pi}{4}$ $+\frac{8\pi}{4} = \frac{3\pi}{4}$

$-\frac{5\pi}{4} - \frac{8\pi}{4} = -\frac{13\pi}{4}$

-5.2

$\frac{9\pi}{4}$

Nov 21-9:21 AM

Complementary Angles: Two positive angles whose sum is [ ] or [ ] or [ ]

Supplementary Angles: Two positive angles whose sum is [ ] or [ ] or [ ]

Give the complement and supplement for the following:

42°

42 + C = 90

C = 48

42 + S = 180

S = 128

$\frac{2\pi}{9}$

$\frac{2\pi}{9} + C = \frac{\pi}{2}$

$C = \frac{9\pi}{18} - \frac{4\pi}{18}$

$= \frac{5\pi}{18}$

$\frac{2\pi}{9} + S = \pi \Rightarrow S = \frac{7\pi}{9}$

1.45

1.45 + C = 1.57

C = 0.12

1.45 + S = 3.14

S = 1.69

97° 97 + C = 90, C = −7 ✗

$\frac{9\pi}{8}$

Nov 21-9:26 AM

Conversions Between Degrees and Radians

1. To convert degrees to radians, multiply degrees by $\frac{\pi \text{ rad}}{180^\circ}$.
2. To convert radians to degrees, multiply radians by $\frac{180^\circ}{\pi \text{ rad}}$.

To apply these two conversion rules, use the basic relationship π rad $= 180^\circ$. (See Figure 4.14.)

1. 225° in terms of π

$225^\circ \cdot \frac{\pi}{180^\circ} = \frac{225\pi}{180} = \frac{5\pi}{4}$

2. 320° in terms of π

$320 \cdot \frac{\pi}{180} = \frac{32\pi}{18} = \frac{16\pi}{9}$

3. 112° in decimal form

$112 \cdot \frac{\pi}{180} = \frac{112\pi}{180} = 1.95$ radians

4. $\frac{5\pi}{3} \cdot \frac{180}{\pi} = 300^\circ$

5. 3.2 *radians*

$3.2 \cdot \frac{180}{\pi}$

183.35°

Nov 21-9:39 AM

Degrees, Minutes, Seconds on Calculator

Convert 39.25° to DMS. $39^\circ 15' 0''$

Convert $185^\circ 13' 42''$ decimal form.

185.23°

Nov 21-9:44 AM

HOMEWORK

p 290 7-77 odd

omit #13, 15, 25, 27, 29, 35, 37

Values Quiz #1 is Monday

Feb 2-9:51 PM