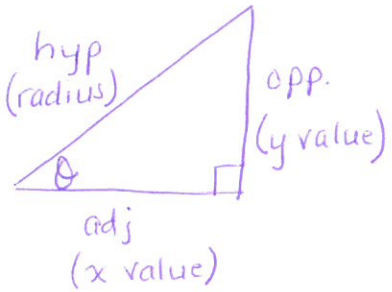
Section 2-3 Sine and Cosine

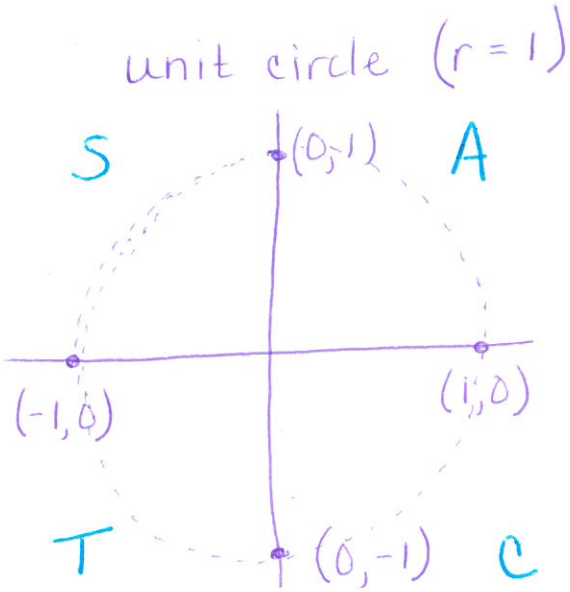
SOH–CAH–TOA

$\sin\theta = \frac{O}{H}$

$\cos\theta = \frac{A}{H}$

$\tan\theta = \frac{O}{A}$



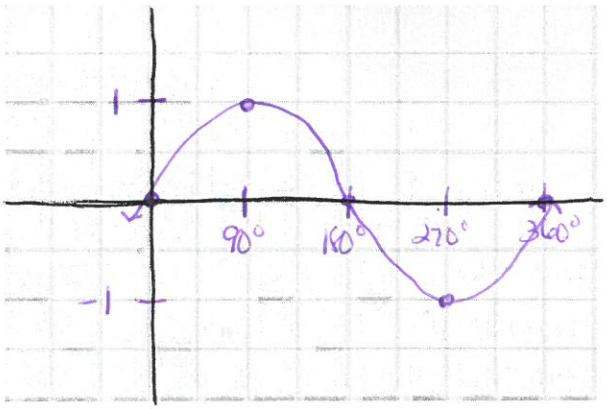


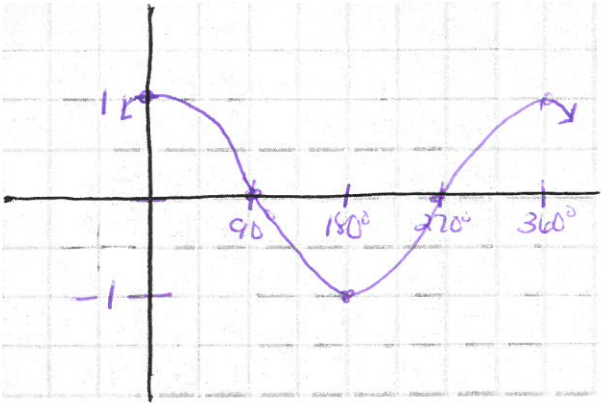
$y = \sin x$ * sinx is the y coordinate in the unit circle

x	0	90	180	270	360
y	0	1	0	-1	0

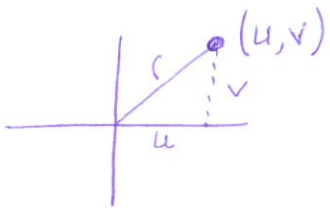
$y = \cos x$ * cos x is the x coordinate in the unit circle

x	0	90	180	270	360
y	1	0	-1	0	1





These are **periodic graphs (repeat at regular intervals). One **period** is graphed here.



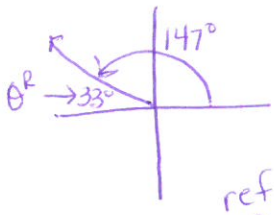
Let (u, v) be a point r units from the origin on the terminal side of a rotating ray.

$\sin\theta = \frac{v}{r}$ or $\frac{y}{r}$ $\qquad \cos\theta = \frac{u}{r}$ or $\frac{x}{r}$

θ^R = ref. ∠

Draw the angle in standard position. Find the reference angle. Find the sine or cosine of the angle and its reference angle. Explain the relationship between them.

1. cos 147°



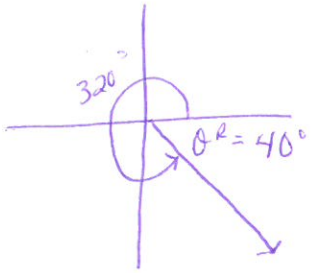
$\sin 147° = .5446$

$\cos 147° = -.8387$

ref θ: $\sin 33° = .5446$, $\cos 33° = .8387$

trig. functions of ref. ∠s are the abs. value of the trig. funct. of the actual angle

2. sin 320°



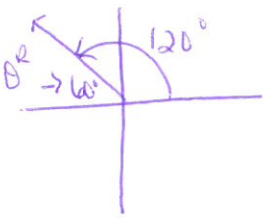
$\sin 320° = -.6428$

$\cos 320° = .7660$

$\sin 40° = .6428$

$\cos 40° = .7660$

3. sin 120°



$\sin 120° = .8660$

$\cos 120° = -.5$

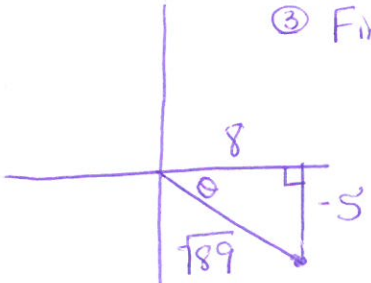
$\sin 60° = .8660$

$\cos 60° = .5$

Use the definition of sine and cosine whose terminal side contains the given point. (not unit circle)

4. (8, -5)

① Draw a △
② Find r
③ Find sin θ + cos θ



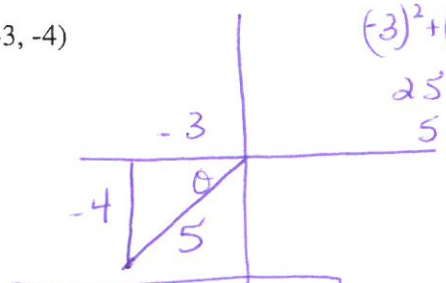
$8^2 + (-5)^2 = r^2$

$89 = r^2$

$\sqrt{89} = r$

$\sin\theta = \frac{-5}{\sqrt{89}}$ $\qquad \cos\theta = \frac{8}{\sqrt{89}}$

5. (-3, -4)



$(-3)^2 + (-4)^2 = r^2$

$25 = r^2$

$5 = r$

$\sin\theta = \frac{-4}{5}$

$\cos\theta = \frac{-3}{5}$