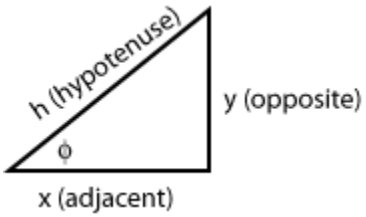
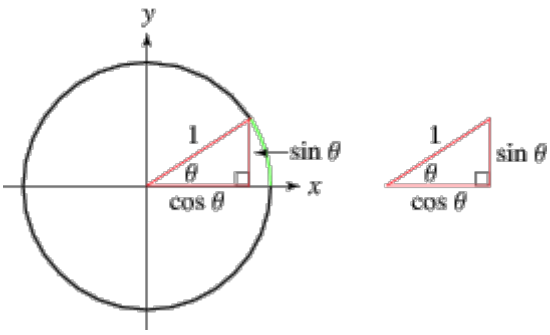
CS 145 Images and Imagination
Lab 3: Trig Relationships
Spring 2014

Use the following information to solve the problems below.



a. Pythagorean formula $x^2 + y^2 = h^2$
or $\sin^2(\Theta) + \cos^2(\Theta) = 1$

b. For general right triangle: SohCahToa:
Sin = Opposite/Hypotenuse
Cos = Adjacent/Hypotenuse,
Tan = Opposite/Adjacent

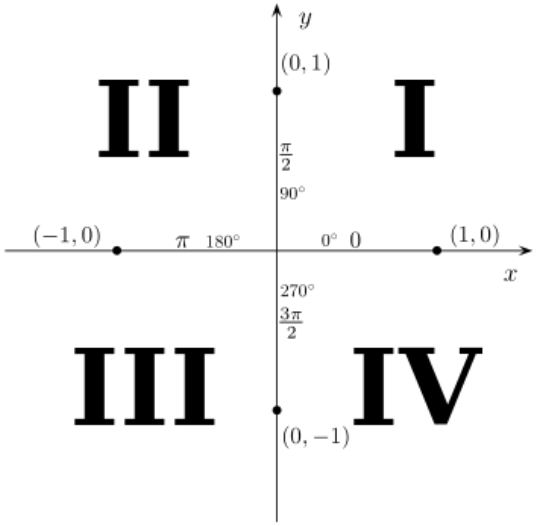


c. Trig values for a few angles:

$\sin(30^o) = 1/2$, $\cos(30^o) = .866 = \sqrt{3}/2$,

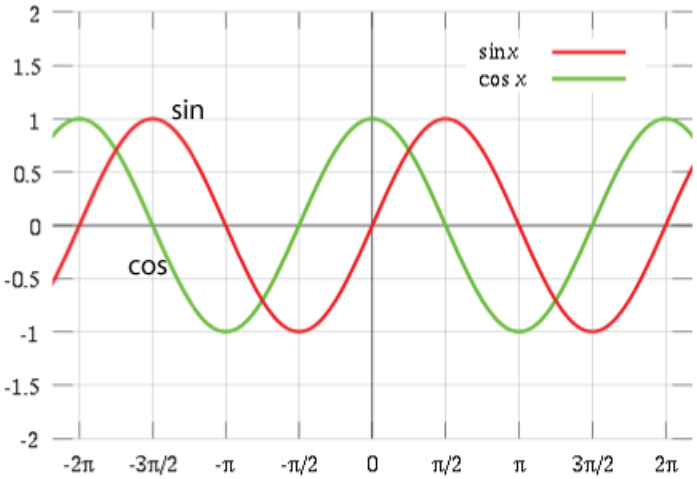
$\sin(45^o) = .707 = \sqrt{2}/2$

d. Quadrants:



e. Degrees vs Radians: 1 complete circumference = 360° = 2 π, or $180^o = \pi$ or $90^o = \pi/2$

f. Graph of sin and cos, as a function of angle in radians.



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1. Figure A shows the graph y as a function of Θ for some *amplitude*, *frequency*, and *phase*.

   y = *amplitude** sin(*frequency**Θ + *phase*)

   For each of the Figures B-F, circle how the values of *amplitude*, *frequency*, and *phase* are different (i.e. larger or smaller or same) from Figure A. If you aren't sure, try plotting y in Processing!

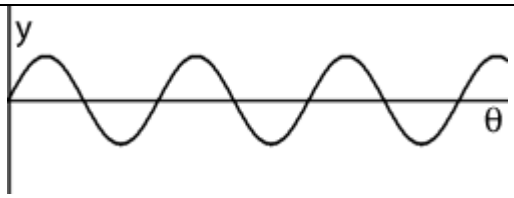

Figure A:

y = *amplitude** sin(*frequency**Θ + *phase*)

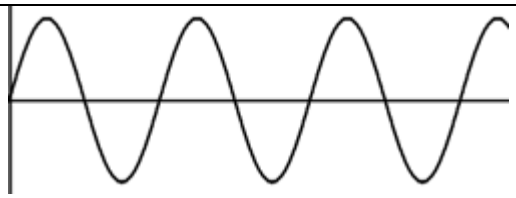

Figure B

amplitude: smaller same bigger
frequency: smaller same bigger
phase: same different

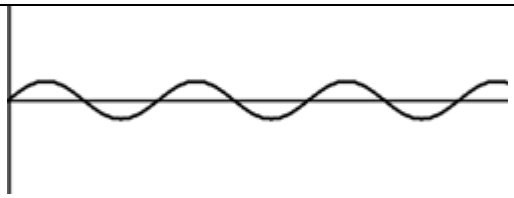

Figure C

amplitude: smaller same bigger
frequency: smaller same bigger
phase: same different

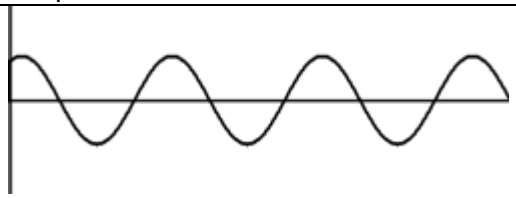

Figure D

amplitude: smaller same bigger
frequency: smaller same bigger
phase: same different

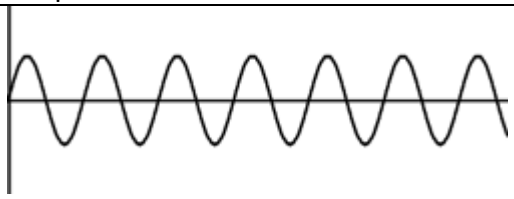

Figure E

amplitude: smaller same bigger
frequency: smaller same bigger
phase: same different

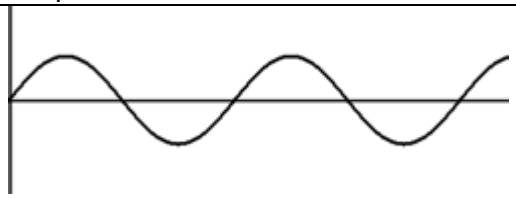

Figure F

amplitude: smaller same bigger
frequency: smaller same bigger
phase: same different

2. Fill in the missing information assuming a triangle shown above:

	Triangle 1	Triangle 2	Triangle 3
h	5	1	
x	4		.5
y		.707	$\sqrt{3}/2$

3. Fill in the table with the missing values by using you're the information on the previous page.

Angle 1 is done for you!

No calculator should be used for this! Numeric values should be expressed as integers or fractions (e.g. $\sqrt{3}/2$) or infinity (∞). Simplify your answers where possible.

	Angle 1	**Angle 2**	**Angle 3**	**Angle 4**	**Angle 5**	**Angle 6**	**Angle 7**	**Angle 8**
Radian Measure	$\pi/6$		$-\pi/2$		$3\pi/4$		$7\pi/6$	
Degree Measure	30º	-30º		420º		225º		240º
Quadrant I, II, III, IV If on border, give both.	I							
sin(Θ)	1/2							
cos(Θ)	$\sqrt{3}/2$							
tan(Θ)	$1/\sqrt{3}$							