Lab 3: Angles on the Unit Circle

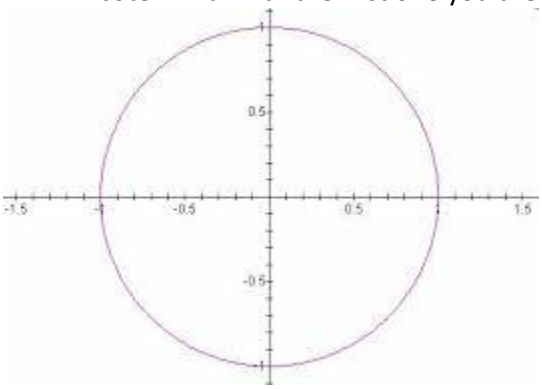
In this lab, you'll explore the relationships between trig functions and angles on the unit circle. Each question you have to answer or angle you have to draw is worth 1 point (except for all of the values in Task 3, which are worth ¼ point each) for a total of 30 points.

Task 1 (4 pts): An angle has a sine of 0.8.

a) Use your calculator to find the angle's measure in degrees (to the nearest whole number). What is it?

b) Draw that angle on the unit circle below. Don't forget your directional arrow. (If you use the fact that the sine is 0.8, you don't need a protractor to draw the angle accurately!)

c) Draw another positive angle on the unit circle that has that *same* sine. (This angle should **not** be coterminal with the first one you drew.) What is its measure, to the nearest degree?

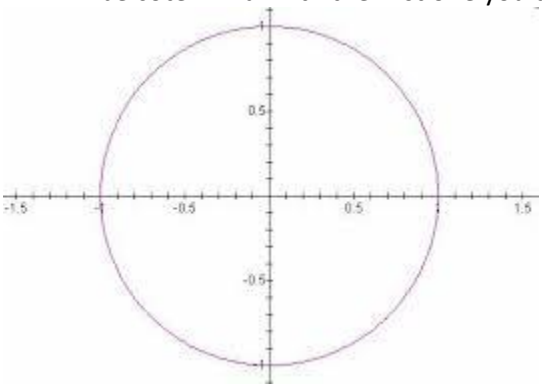


Task 2 (4 pts): An angle has a cosine of -0.4.

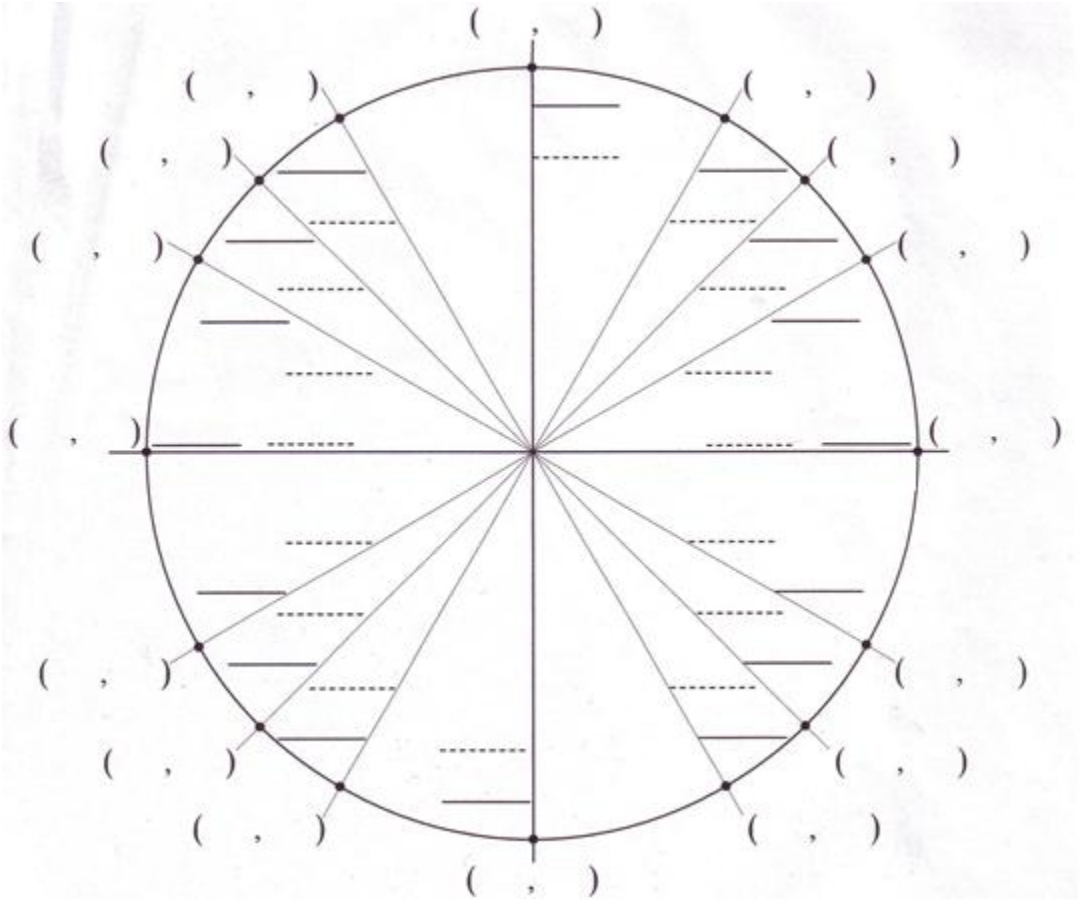
a) Use your calculator to find the angle's measure in degrees (to the nearest whole number). What is it?

b) Draw that angle on the unit circle below.

c) Draw another positive angle on the unit circle that has that *same* cosine. (This angle should **not** be coterminal with the first one you drew.) What is its measure, to the nearest degree?



Task 3 (16 pts): Angles from 0 to 330 degrees are drawn here for you in standard position. (They are all multiples of 30 or 45 degrees.) On each solid line, write the angle's measure in degrees. On each dotted line, write the measure in radians as a fraction of π. Then fill in the ordered pairs to indicate where each terminal side intersects the unit circle. Use **exact values** (which may involve square roots), not decimal approximations. You may find this image to be a useful reference in the future!



Task 4 (6 pts): the terminal side of an angle θ in standard position intersects the unit circle at a point with x-coordinate 1/5.

a) What is $\cos\theta$? Don't overthink this one!

b) List all the possible values of $\sin\theta$ (use exact values, no decimals). Show your work.

c) List all the possible values of $\tan\theta$ (use exact values, no decimals). Show your work.

d) How many values are possible for $\csc\theta$? (You don't have to find them, or show your work)