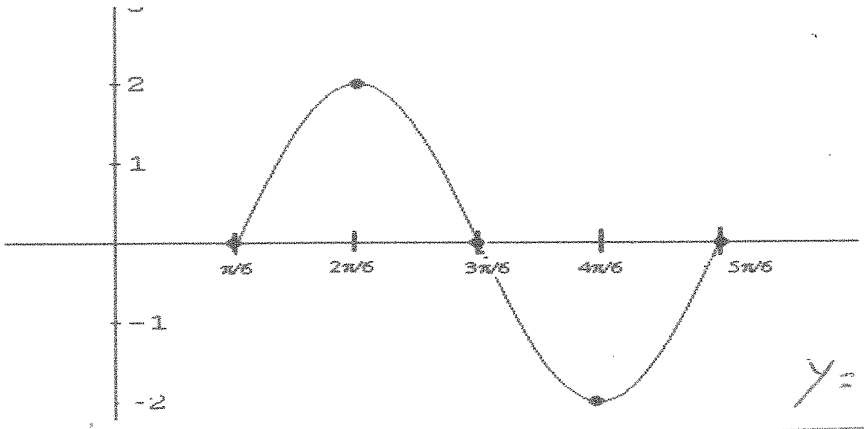
7. Find an **equation** of the form $y = a\cos(bx - c) + d$ whose one cycle of the graph is shown below. (5 pts)



$a = 2$

period $\frac{2\pi}{b} = \frac{2\pi}{3}$

$b = 3$

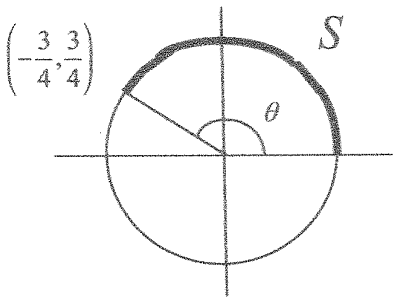
phase shift $= \frac{\pi}{3}$

$d = 0$

$y = 2\cos\left[3\left(x - \frac{\pi}{3}\right)\right]$

$\boxed{y = 2\cos(3x - \pi) + 0}$

8. Given that the point $\left(-\frac{3}{4}, \frac{3}{4}\right)$ is a point on the terminal side of an angle θ, consider the diagram below. (4 pts each)



(a) Find the **exact radius** of the circle.

$r = \sqrt{(-\frac{3}{4})^2 + (\frac{3}{4})^2} = \sqrt{\frac{9}{16} + \frac{9}{16}}$

$= \sqrt{\frac{18}{16}} = \boxed{\frac{3\sqrt{2}}{4}}$

(a) Find the **exact angle** θ.

$\tan\theta = \frac{\frac{3}{4}}{-\frac{3}{4}} = -1 \Rightarrow \boxed{\theta = \frac{3\pi}{4}}$

(b) Find the **exact value** of $\cot\theta$.

$\cot\theta$

$= \cot\left(\frac{3\pi}{4}\right) = \boxed{-1}$