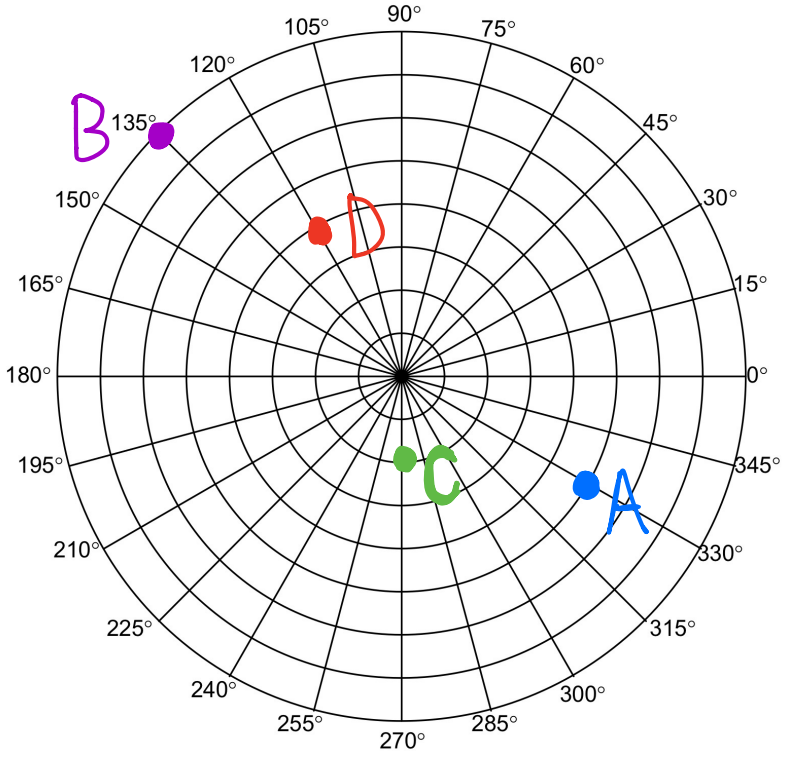
Video Quiz 10

Instructions: Show all of your work for full credit and submit by 3:30pm Mon. April 24, 2017.

1. (2 pts.) Plot the following points in the polar coordinate system below.

$$A = \left(5, -\frac{\pi}{6}\right), \quad B = \left(8, \frac{3\pi}{4}\right), \quad C = \left(-2, \frac{\pi}{2}\right), \quad D = \left(-4, -\frac{\pi}{3}\right)$$



2. (2 pts.) Change the polar coordinates to rectangular coordinates.

(a) $A = (5, \pi)$

$x = r\cos\theta$ $\quad y = r\sin\theta$

$= 5\cos(\pi)$ $\quad = 5\sin(\pi)$

$= 5(-1)$ $\quad = 5(0)$

$= -5$ $\quad = 0$

$\Rightarrow \boxed{A = (-5, 0)}$

(b) $B = (-3, 120°)$

$x = r\cos\theta$ $\quad y = r\sin\theta$

$= -3\cos(120°)$ $\quad = -3\sin(120°)$

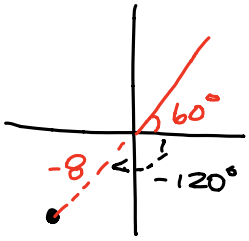
$= -3\left(\frac{-1}{2}\right)$ $\quad = -3\left(\frac{\sqrt{3}}{2}\right)$

$= \frac{3}{2}$ $\quad = -\frac{3\sqrt{3}}{2}$

$\Rightarrow \boxed{A = \left(\frac{3}{2}, \frac{-3\sqrt{3}}{2}\right)}$

A =

3. (2 pts.) Convert the rectangular coordinates $(-4, -4\sqrt{3})$ to polar coordinates.



$r^2 = x^2 + y^2$

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

$= 16 + 16 \cdot 3$

$= 16 + 48$

$= 64$

$\Rightarrow r = \pm\sqrt{64}$

$\Rightarrow r = 8$ or $\boxed{r = -8}$

$\tan\theta = \frac{y}{x}$

$\tan\theta = \frac{-4\sqrt{3}}{-4}$

$= \sqrt{3}$

$\Rightarrow \theta = \tan^{-1}\sqrt{3}$

$\theta = 60°$

$\Rightarrow \boxed{A = (-8, 60°)}$

or $\boxed{A = (8, -120°)}$

4. (2 pts.) Change $x^2 + y^2 - 6x = 0$ from rectangular to polar form.

$x^2 + y^2 - 6x = 0$

$r^2 - 6r\cos\theta = 0$

$r(r - 6\cos\theta) = 0$

$\Rightarrow r = 0 \quad r - 6\cos\theta = 0$

$\boxed{r = 6\cos\theta}$

5. (2 pts.) Change $r = 8\cos\theta$ from polar to rectangular form.

$r = 8\cos\theta$

$\Rightarrow r^2 = 8r\cos\theta$

$x^2 + y^2 = 8x$

$\boxed{x^2 + y^2 - 8x = 0}$