recalculus Unit 7 Homework—Polar Coordinates and Equations

Part 1 -- For each polar point, label it in two other ways: * answers may vary *

a) $(4, 60°)$

$(4, 420°)(-4, 240°)$

b) $(-5, 315°)$

$(5, 135°)\ (5, -225°)$

c) $(2, -90°)$

$(2, 270°)\ (-2, 90°)$

d) $\left(1, \frac{5\pi}{6}\right)$

$\left(1, -\frac{7\pi}{6}\right)\left(-1, \frac{11\pi}{6}\right)$

e) $\left(-8, \frac{\pi}{6}\right)$

$\left(8, \frac{7\pi}{6}\right)\left(8, -\frac{5\pi}{6}\right)$

f) $\left(-\frac{3}{2}, -\frac{5\pi}{3}\right)$

$\left(\frac{3}{2}, \frac{4\pi}{3}\right)\ \left(-\frac{3}{2}, \frac{\pi}{3}\right)$

Part 2 -- Convert the following polar points to rectangular coordinates.

a) $(6, 90°)$

$(0, 6)$

b) $(5, 60°)$

$\left(\frac{5}{2}, \frac{5\sqrt{3}}{2}\right)$

c) $(10, 225°)$

$(-5\sqrt{2}, -5\sqrt{2})$

d) $(5, \pi)$

$(-5, 0)$

e) $\left(2\sqrt{3}, \frac{\pi}{6}\right)$

$(3, \sqrt{3})$

f) $\left(\frac{5}{2}, \frac{5\pi}{3}\right)$

$\left(\frac{5}{4}, -\frac{5\sqrt{3}}{4}\right)$

Part 3 -- Convert the following rectangular points to polar coordinates. * answers may vary *

a) $(-5, -5)$

$(5\sqrt{2}, 225°)$

b) $(0, -2)$

$\left(2, \frac{3\pi}{2}\right)$

c) $(1, -\sqrt{3})$

$\left(2, \frac{5\pi}{3}\right)$

d) $(-7, 0)$

$(7, \pi)$

e) $(5, 12)$

$(13, 67.4°)$

f) $(6, -3)$

$(3\sqrt{5}, -26.6°)$

Part 4 -- Convert the following rectangular equations to polar equations.

a) $x^2 + y^2 = 25$

$r = \pm 5$

b) $(x + 2)^2 + y^2 = 4$

$r = -4\cos\theta$

c) $y = 3$

$r = 3\csc\theta$

d) $x = 3$

$r = 3\sec\theta$

e) $xy = 1$

$r = \pm\sqrt{\sec\theta\csc\theta}$

f) $2x - 3y - 2 = 0$

$r = \frac{2}{2\cos\theta - 3\sin\theta}$

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Part 5 -- Convert the following polar equations to rectangular equations.

a) $r = 2$

$x^2 + y^2 = 4$

b) $\theta = \frac{2\pi}{3}$

$y = -x\sqrt{3}$

c) $r = 4\sec\theta$

$x = 4$

d) $r = -2\csc\theta$

$y = -2$

e) $r = \frac{12}{3\sin\theta - 4\cos\theta}$

$y = \frac{4}{3}x + 4$

f) $r = \frac{3}{1 + \sin\theta}$

$y = -\frac{1}{6}x^2 + \frac{3}{2}$