6.3A

omit #11 or change to $(1, \sqrt{3})$

Trig Worksheet: Polar and Rectangular Coordinates

Name: Key Date: _____ out of 24

Find the polar coordinates of each point given in rectangular form.

1. (0, 4)

$r=4 \quad \theta=\pi/2$

$(4, \pi/2)$

2. $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ $r=1 \quad \theta=\frac{5\pi}{3}$

$(1, 5\pi/3)$

3. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ $\theta=\frac{5\pi}{6}$

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

4. (4, 0)

$(4, 0)$

5. $(-1, -\sqrt{3})$

$r=\sqrt{1+3}=2$

$(2, 4\pi/3)$

6. (2, 2) $r=\sqrt{8}=2\sqrt{2}$

$(2\sqrt{2}, \pi/4)$

7. (-2, 2)

$(2\sqrt{2}, 3\pi/4)$

8. (2, -2)

$(2\sqrt{2}, 7\pi/4)$

9. $(-2\sqrt{3}, 2)$ $r=\sqrt{4\cdot 3+4}=4$

$\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)=\frac{\pi}{6}$

$\left(4, \frac{5\pi}{6}\right)$

10. $(-\sqrt{3}, -1)$

$r=2$

$(2, 7\pi/6)$

11. $(+1, +\sqrt{3})$ change to $(1, \sqrt{3})$

Same as #5

$(2, \pi/3)$

12. (0, -6)

$(6, 3\pi/2)$

Find the rectangular coordinates of each point with the given polar coordinates.

1. (6, 120°)

$x=6\cos 120^\circ=-3$

$y=6\sin 120^\circ=6\left(\frac{\sqrt{3}}{2}\right)=3\sqrt{3}$

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

2. (-4, 45°)

$x=-4\cos 45^\circ$

$y=-4\sin 45^\circ$

$-4(\sqrt{2}/2)=-2\sqrt{2}$

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

3. (3, 300°)

$x=3\cos 300^\circ=1.5$

$y=3\sin 300^\circ=3\left(-\frac{\sqrt{3}}{2}\right)$

$(3/2, -3\sqrt{3}/2)$

4. (4, π/6)

$4\cos \pi/6 = 4(\sqrt{3}/2)$

$4\sin \pi/6 = 4(1/2)$

$(2\sqrt{3}, 2)$

5. (0, 13π /3)

$(0,0)$

6. (3, -3π /4)

$x = 3\cos -\frac{3\pi}{4} = 3\left(\frac{\sqrt{2}}{2}\right)$

$y = 3\sin\left(-\frac{3\pi}{4}\right) = 3\left(-\frac{\sqrt{2}}{2}\right)$

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

7. (4, 90⁰)

$4\cos 90^\circ = 0$

$4\sin 90^\circ = 4$

$(0,4)$

8. (6, 180⁰)

$6\cos 180^\circ$

$6\sin 180^\circ$

$(-6,0)$

9. (-4, π /2)

$-4\cos \pi/2$

$-4\sin \pi/2$

$(0,-4)$

10. (-6, 3 π/2)

$-6\cos \frac{3\pi}{2} = 0$

$-6\sin \frac{3\pi}{2} = 6$

$(0,6)$

11. (7.4, 2.5)

$(-5.93, 4.43)$

12. (8.3, 4.6)

$(-.93, -8.25)$