

Pre-calculus Worksheet

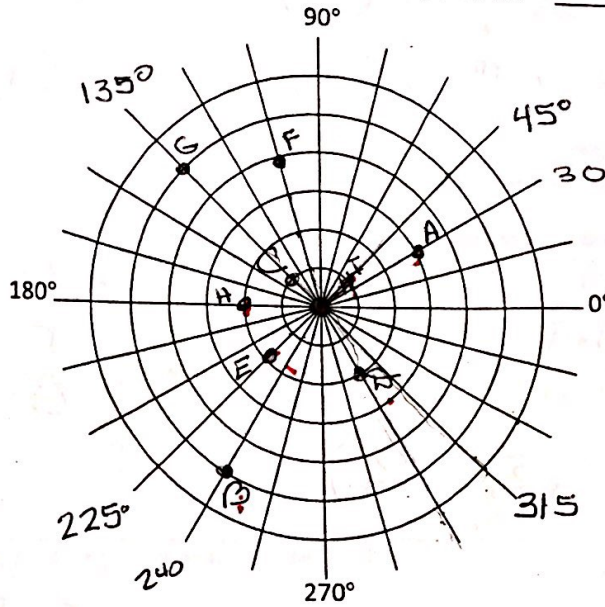
Name: Schade

Section 10.7 - Polar Coordinates

Period: _____

I. Graph and label each point.

1. $A(3, 30^\circ)$
2. $B(5, 240^\circ)$
3. $C(1, 135^\circ)$
4. $D(2, -60^\circ)$
5. $E(-2, 45^\circ)$
6. $F(-4, 300^\circ)$
7. $G(-5, -45^\circ)$
8. $H(-2, 0^\circ)$
9. $I(0, -270^\circ)$



II. State three other pairs of polar coordinates for each point where $-360^\circ < \theta < 360^\circ$. Show work.

<p>10. $(-2, 150^\circ)$ $(-2, -210^\circ)$ $(2, -30^\circ)$ $(2, 330^\circ)$</p>	<p>11. $(5, -60^\circ)$ $(5, 300^\circ)$ $(-5, 120^\circ)$ $(-5, -240^\circ)$</p>
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III. State three other pairs of polar coordinates for each point where $-2\pi < \theta < 2\pi$. Show work.

<p>12. $(4, \frac{\pi}{5})$ $(-4, -\frac{4\pi}{5})$ $(4, -\frac{9\pi}{5})$ $(-4, \frac{6\pi}{5})$</p>	<p>13. $(-3, \frac{2\pi}{3})$ $(3, -\frac{\pi}{3})$ $(-3, -\frac{4\pi}{3})$ $(3, \frac{5\pi}{3})$</p>
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IV. A point in polar coordinates is given. Convert the point to rectangular coordinates. Show work.

<p>14. $(3, \frac{\pi}{2})$ $(0, 3)$</p> <p>$x = 3 \cos \frac{\pi}{2}$ $y = 3 \sin \frac{\pi}{2}$</p>	<p>15. $(-1, \frac{5\pi}{4})$ $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$</p> <p>$x = -1 \cos \frac{5\pi}{4} = -1(-\frac{\sqrt{2}}{2})$ $y = -1 \sin \frac{5\pi}{4} = -1(-\frac{\sqrt{2}}{2})$</p>
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16. $(2, \frac{7\pi}{6})$
 $x = 2 \cos \frac{7\pi}{6} = 2 \left(\frac{-\sqrt{3}}{2} \right)$
 $y = 2 \sin \frac{7\pi}{6} = 2 \left(-\frac{1}{2} \right)$
 $(-\sqrt{3}, -1)$

17. $(-2.5, 1.1)$
 Use a calculator.
 $y = -2.5 \sin 1.1$ $x = -2.5 \cos 1.1$
 $(-1.134, -2.228)$

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V. A point in rectangular coordinates is given. Convert the point to polar coordinates. Show work.

18. $(-3, -3)$
 $r = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$
 $\theta = \tan^{-1}(1) = \frac{5\pi}{4}$ (225°)
 $(3\sqrt{2}, \frac{5\pi}{4})$


19. $(-6, 0)$
 $r = \sqrt{36} = 6$
 $\theta = \tan^{-1}(0/-6) = 180^\circ = \pi$
 $(6, \pi)$

20. $(4, -4\sqrt{3})$
 $r = \sqrt{16+48} = 8$
 $\theta = \tan^{-1}(-\sqrt{3}) = \frac{5\pi}{3}$ (want QIV)
 $(8, \frac{5\pi}{3})$

21. $(-3, 4)$
 $r = \sqrt{9+16} = 5$
 $\theta = \tan^{-1}(-4/3) \sim 126.87^\circ$
 $\sim 2.214 \text{ rad}$
 $(5, 2.214)$

VI. Convert the rectangular equation to polar form.

22. $x^2 + y^2 = 9$
 $r^2 = 9$
 $r = 3$



23. $y = 4$
 $4 = r \cos \theta$
 $r = 4 / \cos \theta$

24. $y = x$

VII. Convert each polar equation to rectangular form.

25. $r = -5 \sec \theta$

26. $r = 4 \sin \theta$

26. $r = 4$