

Name: _____

Period: _____

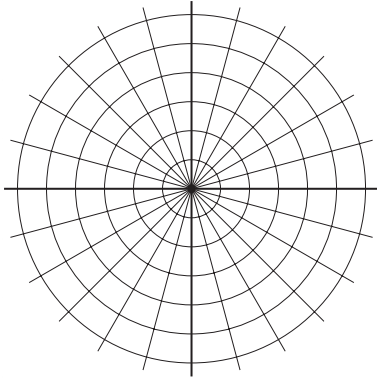
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MPS22 EXAM 5 PRACTICE TEST

SHOW ALL WORK. Give exact answers unless indicated otherwise. Place a box around your final answers. Point values are given in brackets.

1. (a) Plot the point $\left(4, \frac{5\pi}{6}\right)$ on the polar plane below.

- (b) State *two* other sets of polar coordinates [6] that represent the point $\left(4, \frac{5\pi}{6}\right)$ where $r < 0$.



2. Find the exact rectangular coordinates [8] of the point $\left(-8, \frac{5\pi}{3}\right)$.

3. Find the exact polar coordinates of the [8] point $(-3, 3)$.

4. Convert the equation to rectangular [8] form: $r = \frac{3}{\cos\theta - 4\sin\theta}$

5. Convert the equation to polar form: [8] $y = -3x + 2$

6. Given the complex numbers $z_1 = 6\left(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}\right)$ and $z_2 = 2\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)$. [12]

Find, in trigonometric form:

(a) $z_1 \cdot z_2$

(b) $\frac{z_1}{z_2}$

7. A complex number is given by $-2\sqrt{3} - 2i$. [18]
(a) Express the number in trigonometric form. (b) Use DeMoivre's Theorem to find $(-2\sqrt{3} - 2i)^6$ and express the result in $a + bi$ form.

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8. Find all complex fourth roots of -81 in simplest $a + bi$ form. [16]

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9. Solve for all values of x on the interval $0 \leq x < 2\pi$: $2\cos 2x + 4\cos x = -3$ [16]