

Sample exam 5 Trigonometry

1. Plot the polar point: $\left(3, \frac{7\pi}{6}\right)$
2. Find another representation of the polar point: $\left(12, \frac{2\pi}{3}\right)$
3. Find the rectangular point for the given polar point: $\left(-6, \frac{3\pi}{2}\right)$
4. Convert $x^2 + y^2 = 6x$ into a polar equation.
5. Convert $r = 8\cos\theta + 2\sin\theta$
6. For the Limacon curve, $r = 8 + 2\sin\theta$ select the appropriate description of its graph:
a. Dimpled with no inner loop b. It has an inner loop c. no dimple and no inner loop d. Heart shaped
7. The graph of $r = 2\sin 3\theta$ has how many petals?
8. Plot $z = -3 - 4i$
9. Write $1 + \sqrt{3}i$ in polar form.
10. Write $7\left(\cos\frac{3\pi}{2} + i\sin\frac{3\pi}{2}\right)$ in rectangular form.
11. Multiply $z_1 = \cos\frac{\pi}{6} + i\sin\frac{\pi}{6}$ and $z_2 = \cos\frac{\pi}{4} + i\sin\frac{\pi}{4}$
12. Find $\frac{z_1}{z_2}$, for $z_1 = 3\left(\cos\frac{5\pi}{18} + i\sin\frac{5\pi}{18}\right)$ and $z_2 = 10\left(\cos\frac{\pi}{16} + i\sin\frac{\pi}{16}\right)$
13. Find $(\sqrt{2} - i)^4$
14. Find the complex roots of $27(\cos 306^\circ + i\sin 306^\circ)$

Answers

1. It is in the third quadrant 3 units along the $\frac{7\pi}{6}$ axis.
2. Here is one: $\left(-12, \frac{5\pi}{3}\right)$
3. $(0, 6)$
4. $r = 6\cos\theta$
5. $x^2 + y^2 = 8x + 6y$
6. C
7. 3
8. It's in the third quadrant at $(-3, -4)$
9. $2(\cos 60^\circ + i\sin 60^\circ)$

10. $-7i$

11. $\left(\cos \frac{5\pi}{12} + i \sin \frac{5\pi}{12} \right)$

12. $\frac{3}{10} \left(\cos \frac{31\pi}{144} + i \sin \frac{31\pi}{144} \right)$

13. $-7 - 4\sqrt{2}i$

14. $3(\cos 102^\circ + i \sin 102^\circ), 3(\cos 222^\circ + i \sin 222^\circ), 3(\cos 342^\circ + i \sin 342^\circ)$