

Name _____

Date _____

Year Group _____

Use De Moivre's Theorem to transform the complex number to the form $a + bi$

1. $(3 + \sqrt{3}i)^4$

Find the modulus and the argument

$$a^2 + b^2 = c^2$$

$$\tan \theta = \frac{b}{a}$$

Steps => $\underline{\hspace{1cm}}^2 + (\sqrt{\underline{\hspace{1cm}}})^2 = c^2$

$$\tan \theta = \frac{\sqrt{\underline{\hspace{1cm}}}}{\underline{\hspace{1cm}}}$$

Steps => $\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = c^2$

Steps => $\underline{\hspace{1cm}} = c^2$

$$\theta = \tan^{-1}\left(\frac{\sqrt{\underline{\hspace{1cm}}}}{\underline{\hspace{1cm}}}\right)$$

Steps => $c = \underline{\hspace{1cm}} * \sqrt{\underline{\hspace{1cm}}}$

Find the modulus and the argument

$$z = r^n * [\cos(n\theta) + i * \sin(n\theta)]$$

Steps => $z = (\underline{\hspace{1cm}} * \sqrt{\underline{\hspace{1cm}}})^{\underline{\hspace{1cm}}} * \left[\cos\left(\underline{\hspace{1cm}} * \frac{\pi}{\underline{\hspace{1cm}}}\right) + i * \sin\left(\underline{\hspace{1cm}} * \frac{\pi}{\underline{\hspace{1cm}}}\right) \right]$

Steps => $z = \underline{\hspace{1cm}} * \left[\cos\left(\frac{\underline{\hspace{1cm}}\pi}{\underline{\hspace{1cm}}}\right) + i * \sin\left(\frac{\underline{\hspace{1cm}}\pi}{\underline{\hspace{1cm}}}\right) \right]$

Steps => $z = \underline{\hspace{1cm}} * \left[\frac{\underline{\hspace{1cm}}}{\underline{\hspace{1cm}}} + i * \frac{\sqrt{\underline{\hspace{1cm}}}}{\underline{\hspace{1cm}}} \right]$

Answer => $z = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} i \sqrt{\underline{\hspace{1cm}}}$