Exercise 4

Extracts From

Taylors College COMPLEX NUMBERS Study Guide

+ ANSWERS

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Locus in the Complex Plane Q3-6

3. $|z - z_1|$ measures the distance between _____. $|z - z_1| = |z - z_2|$ means z is _____ from z_1 and z_2. The locus of z is the _____ of the interval joining z_1 and z_2. Find the Cartesian equation of $|z - 1 + i| = |z + 1 - i|$.

4. The graph of $\arg z = \theta$ is _____.

5. $\arg(z - z_1)$ measures _____. The locus of $\arg(z - z_1) = \theta$ is a _____ starting at z_1.

6. $\arg(z - z_1) = \arg(z - z_2)$ means the direction of z from z_1 _____ the direction of z from z_2. The locus of $\arg(z - z_1) = \arg(z - z_2)$ is _____

ANSWERS

Locus in the Complex Plane Q3-6

3. $|z - z_1|$ measures the distance between z and z_1. $|z - z_1| = |z - z_2|$ means z is equidistant from z_1 and z_2. The locus of z is the perpendicular bisector of the interval joining z_1 and z_2. $y = x$.

4. The graph of $\arg z = \theta$ is a ray $\overrightarrow{Oz}$

5. $\arg(z - z_1)$ measures the direction of z from z_1. The locus of $\arg(z - z_1) = \theta$ is a ray starting at z_1.

6. $\arg(z - z_1) = \arg(z - z_2)$ means the direction of z from z_1 equals the direction of z from z_2. The locus of $\arg(z - z_1) = \arg(z - z_2)$ is the line joining z_1 and z_2 with the interval joining z_1 to z_2 removed.