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**CHURCHLANDS SENIOR HIGH SCHOOL**

**MATHEMATICS SPECIALIST 3, 4 TEST ONE 2016**

**NON-Calculator Section**

**Chapters 1, 2,**

**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Time: 50 minutes**

**Total: 46 marks**

1. [3, 2, 6 marks]

(a) If and , prove that:

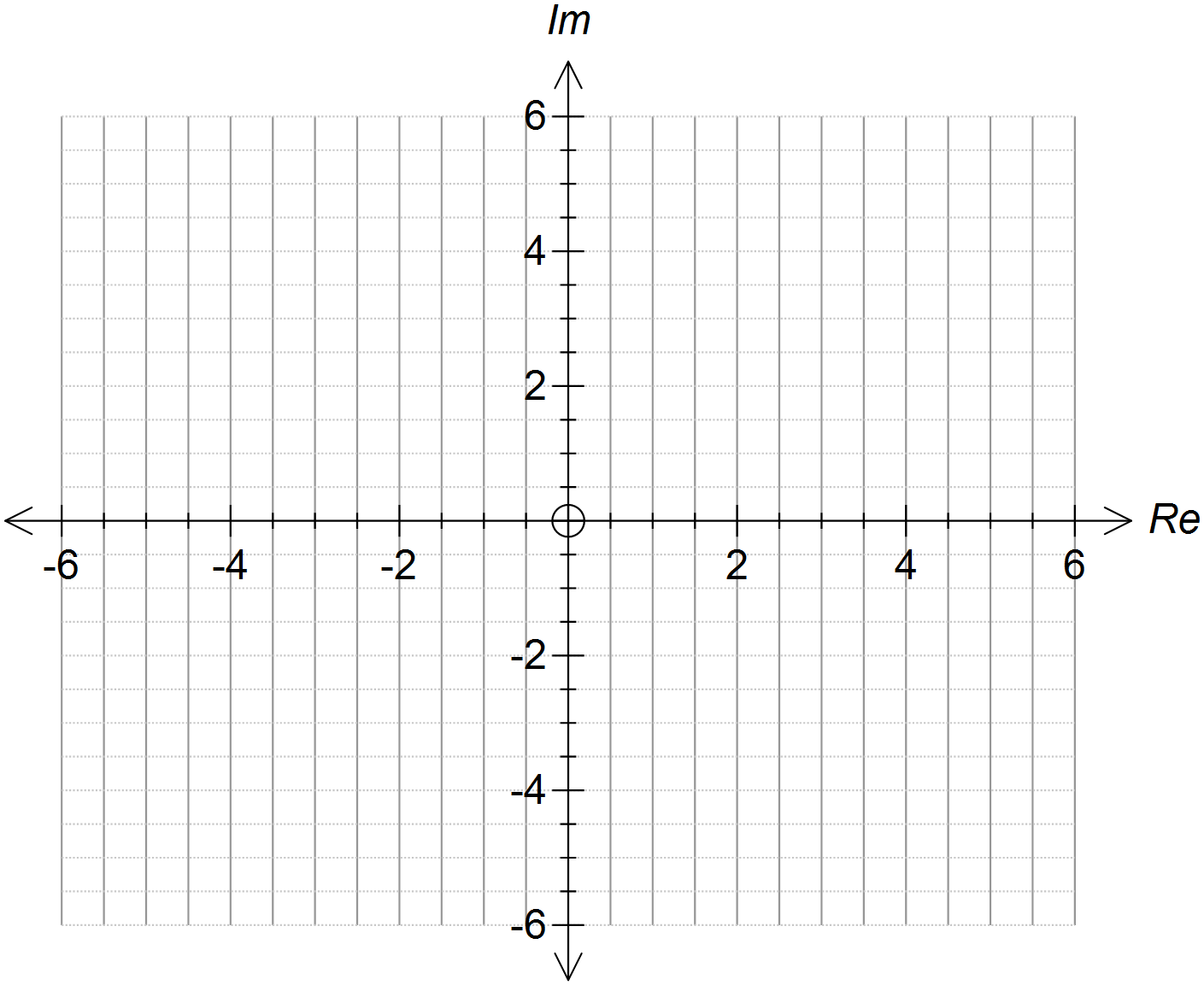
(b) Simplify

(c) Determine if:

2. [3, 1, 1, 2, 3 marks]

(a) Represent the following set on the Argand diagram below.

{*Z* : }



(b) Find

1. the minimum possible value of *Im*(*z*)
2. the maximum possible value of
3. the minimum value of
4. the maximum possible value of arg(*z*), leave your answer in trig form.

3 [2, 1, 3 marks]

(a) Find the remainder when is divided by

(b) If is a factor of find .

(c) The function has as a factor but a remainder of -48 is left when is divided by . Find and .

4 [6 marks]

Find two complex numbers, *w* and *z*, in Cartesian form, such that

and where .

5 [5 Marks]

Use de Moivre’s Theorem to prove that

6 [2+4+2= 8 marks]

Draw separate sketches of the following sets of points in the complex plane.

(a) 



(b) 



(c) 

