

**Mathematics Specialist**

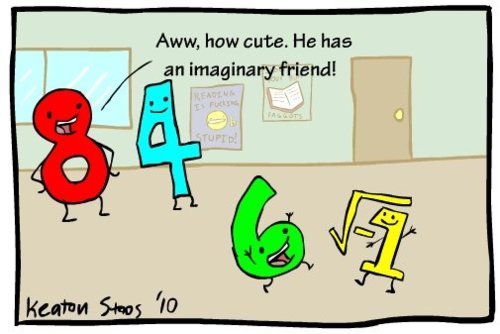
**Test 1 2016**

**Complex Numbers**

**Resource FREE**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TEACHER: MLA**

**28 marks 28 minutes**

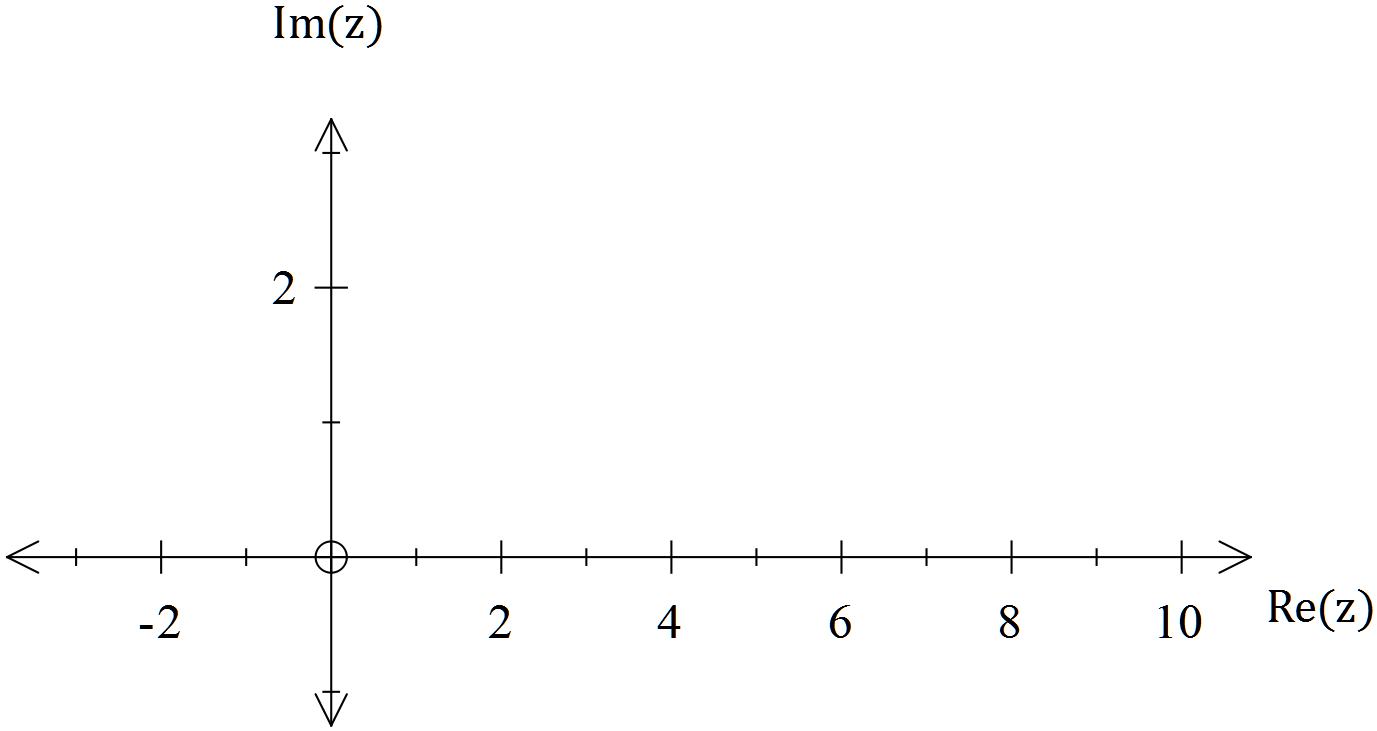


**SCSA formulae sheets may be used in this section**

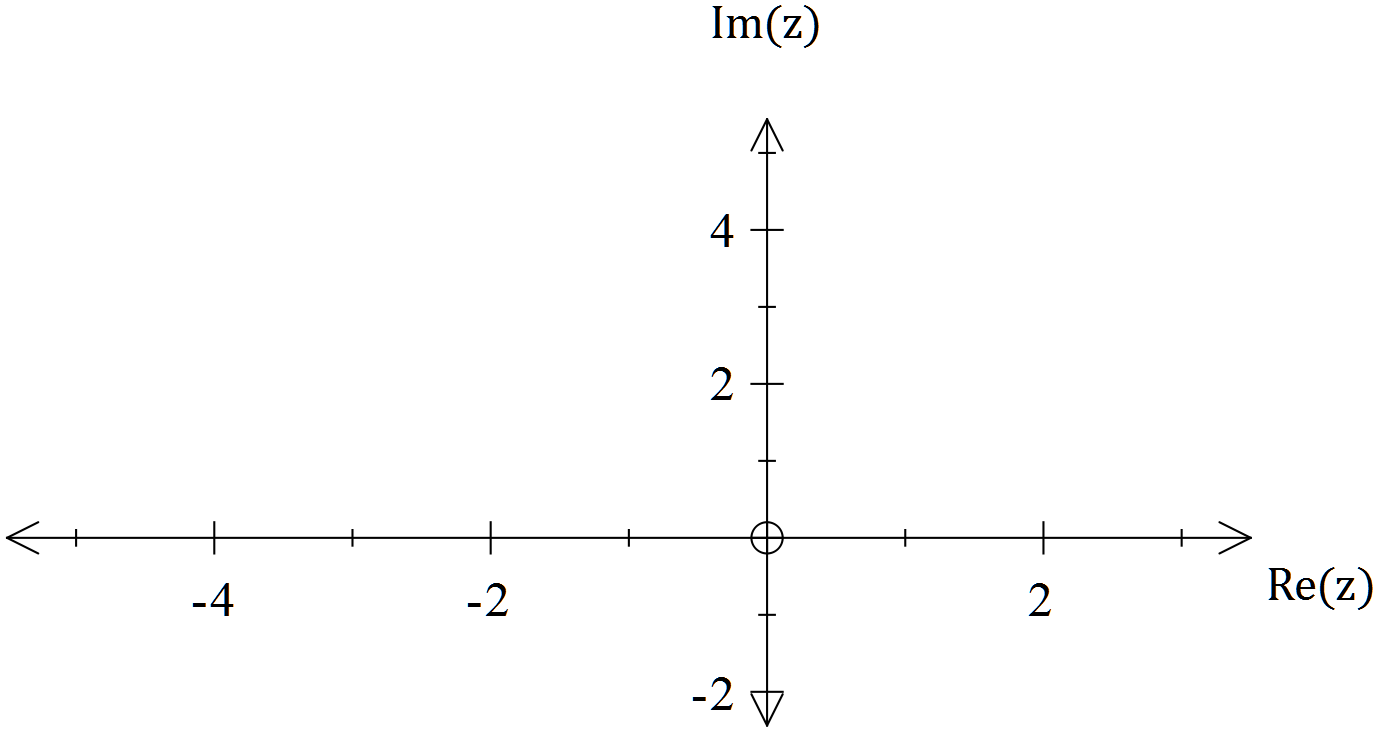
**Question 1 [3, 2, 2 and 2 = 9 marks]**

Represent the following regions on separate Argand diagrams:

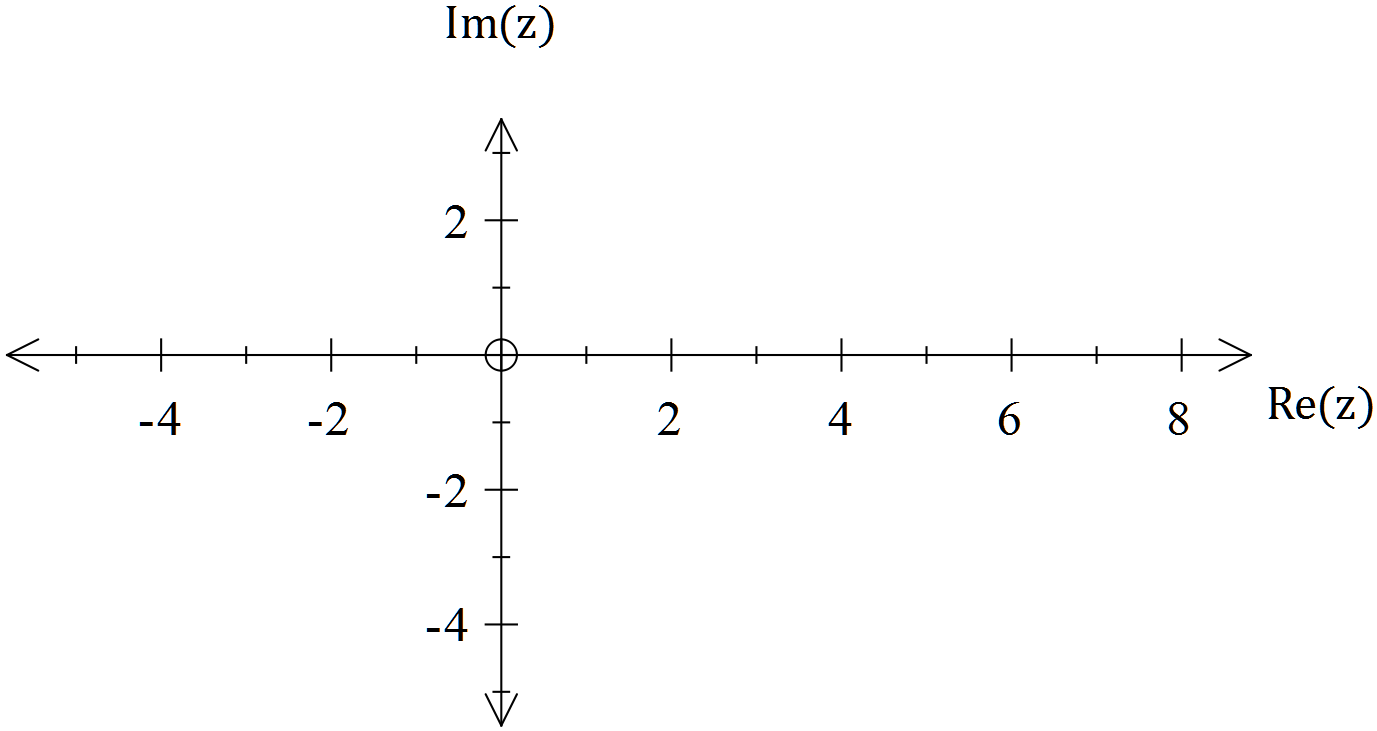
(a)



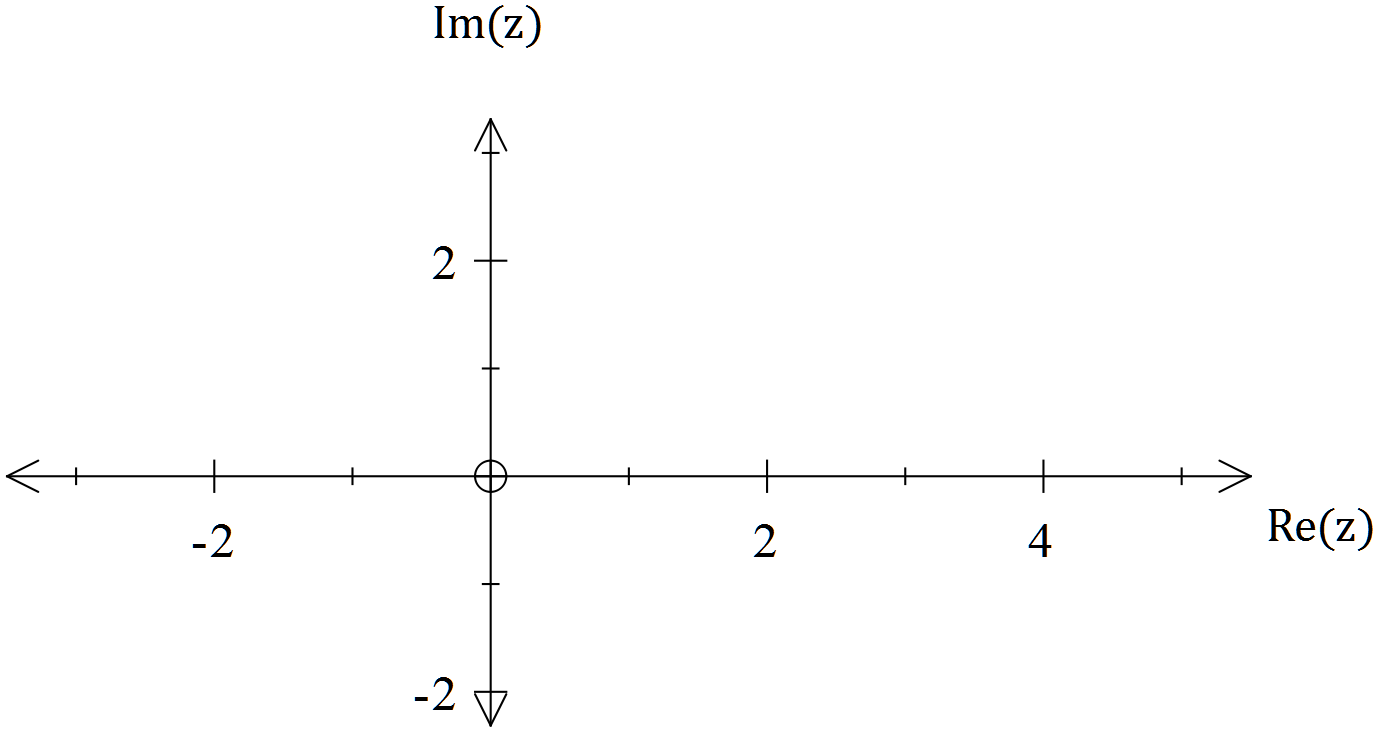
(b) ) +



(c)



(d)



**Question 2 [3, 2 & 3 = 8 marks]**

(a) If

(b) Show that

(c) Express in Cartesian form. Describe the locus of z.

**Question 3 [3 & 2 = 5 marks]**

(a) Use de Moivre’s theorem to solve leaving answers in polar form.

(b) Determine the exact area of the polygon whose vertices are the solutions found above.

**Question 4 [6 marks]**

Consider the identities and.

Use one or both of these identities to prove that.

End of Section 1



**Mathematics Specialist**

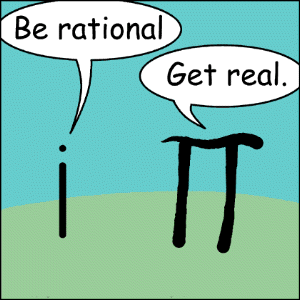
**Test 1 2016**

**Complex Numbers**

**Resource RICH**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TEACHER: MLA**

**22 marks 22 minutes**

[](http://www.google.com.au/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http://lcmaths.weebly.com/complex-numbers.html&ei=D_uIVa3SNcrp8AWdspCoAQ&bvm=bv.96339352,d.dGc&psig=AFQjCNF9Sy89pGnFVkzzP2fW8GWr5xIZ4g&ust=1435126643393504)

**SCSA formulae sheets, ClassPads and a single A4 sheet of notes may be used in this section**

**Clear working must be shown in order to be awarded full marks**

**Question 5 [3 & 3 = 6 marks]**

(a) The polynomial has a factor and leaves a remainder of 16 when it is divided by. Find the values of b and c.

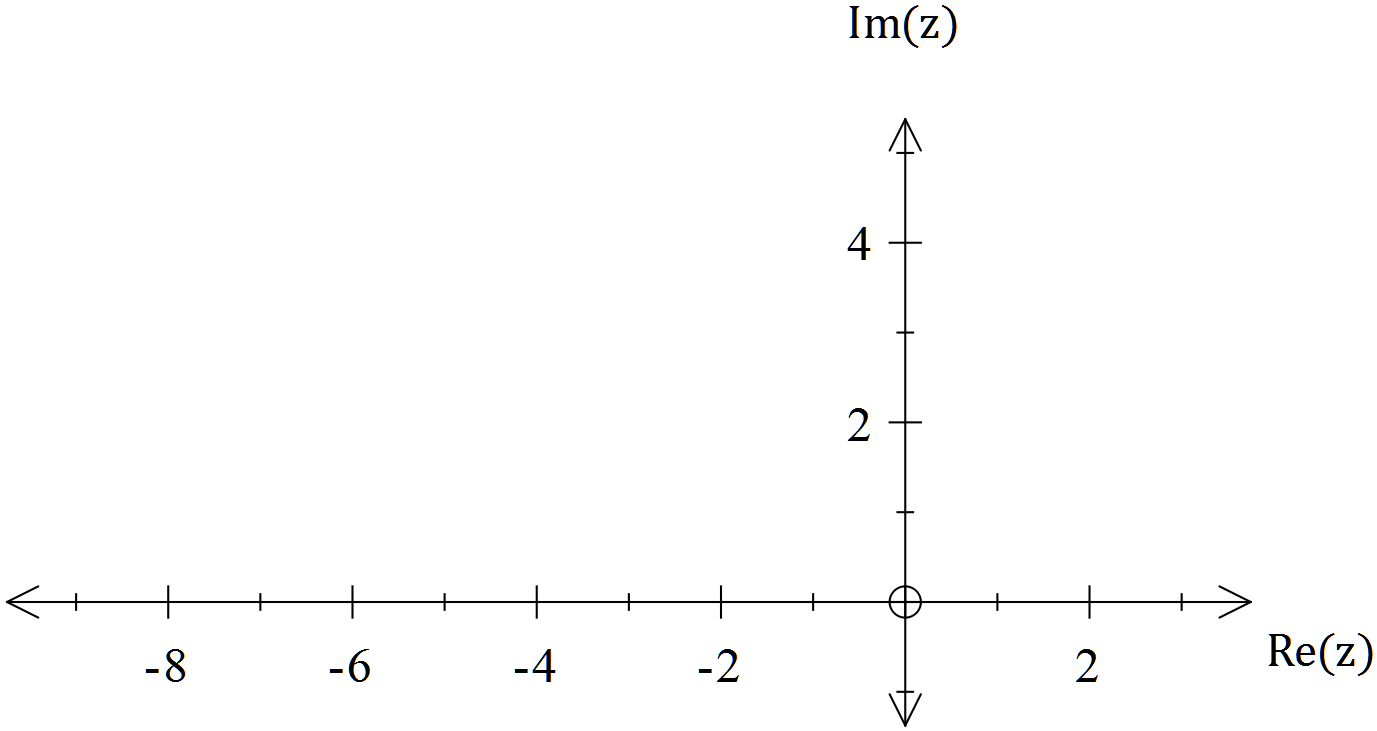
(b) If is a factor of, where is the derivative of with respect to x.

Knowing this, if , determine the values of b and c.

**Question 6 [2, 1, 2 = 5 marks}**

For, determine:

1. The exact maximum possible value of

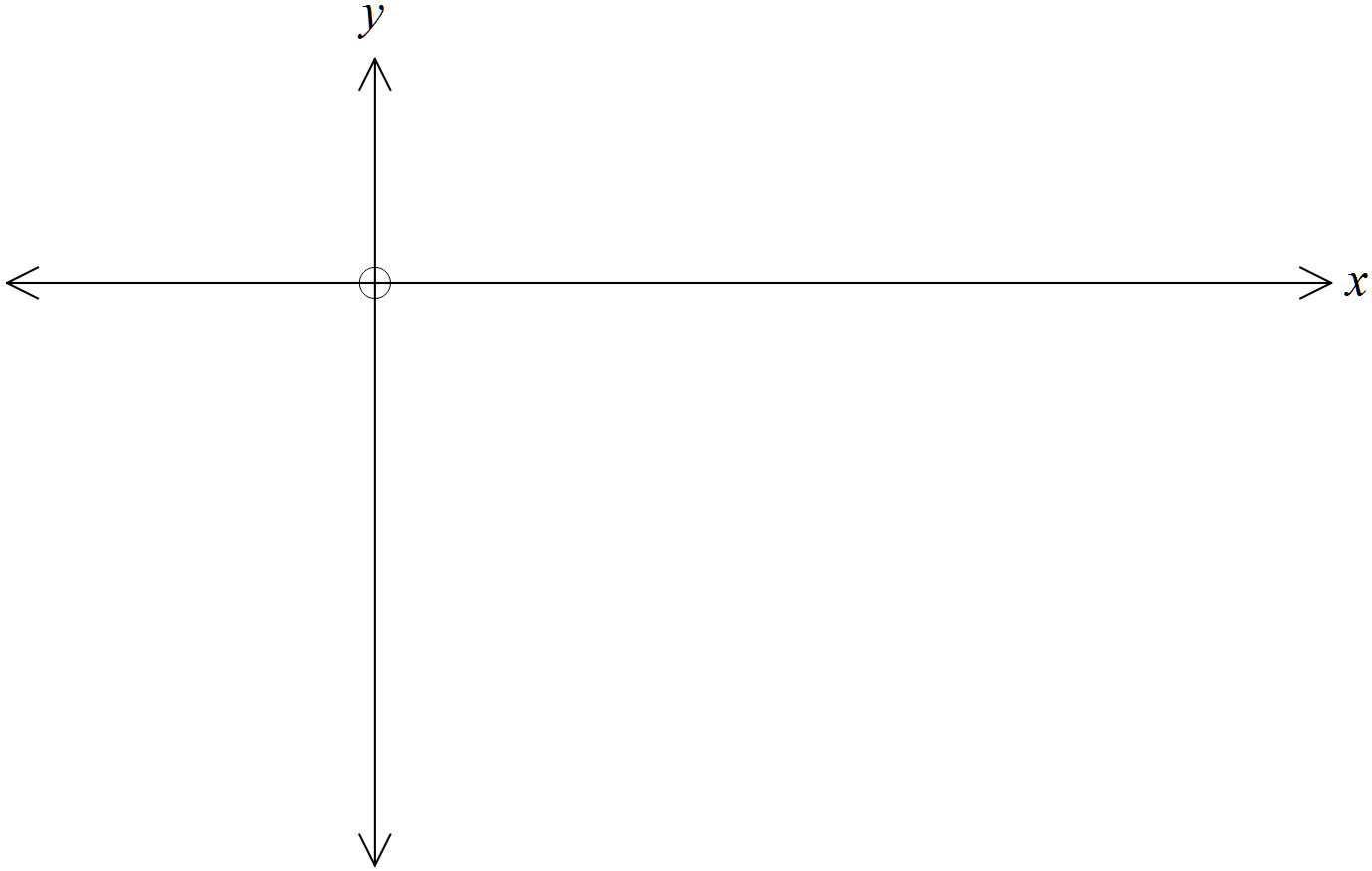


1. The maximum possible value of
2. The minimum possible value of, correct to 1 decimal place.

**Question 7 [4 & 1 = 5 marks]**

(a) Determine the Cartesian equation represented by

(b) Sketch the locus defined in (a)



**Question 8 [6 marks]**

Solve, C, leaving answers in exact form.

End of Section 2