ST. BRIGID'S COLLEGE

Mathematics Specialist Units 3 & 4
Introductory Content Test 2016

Complex Numbers

STUDENT'S NAME: _____

DATE: Term 4 Week 8 **TIME:** 35 minutes **MARKS**: 32

INSTRUCTIONS:

Standard Items: Pens, pencils, pencil sharper, eraser, correction fluid/tape, ruler, highlighters, Formula Sheet.

Questions or parts of questions worth more than 2 marks require working to be shown to receive full marks.

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1. (6 marks)

Convert $\frac{-\sqrt{3}-i}{2}$ to polar form and hence evaluate $\left(\frac{-\sqrt{3}-i}{2}\right)^5$, giving your result in Cartesian form $a+bi$.

2. (8 marks)

Solve the following equations:

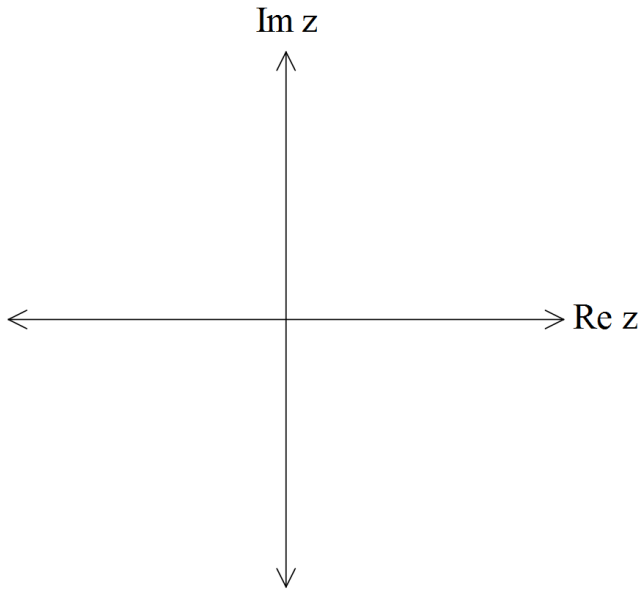
(a) $2z^2 - 4z + 3 = 0$ [3]

(b) $3z^3 - 7z^2 + 3z - 2 = 0$ [5]

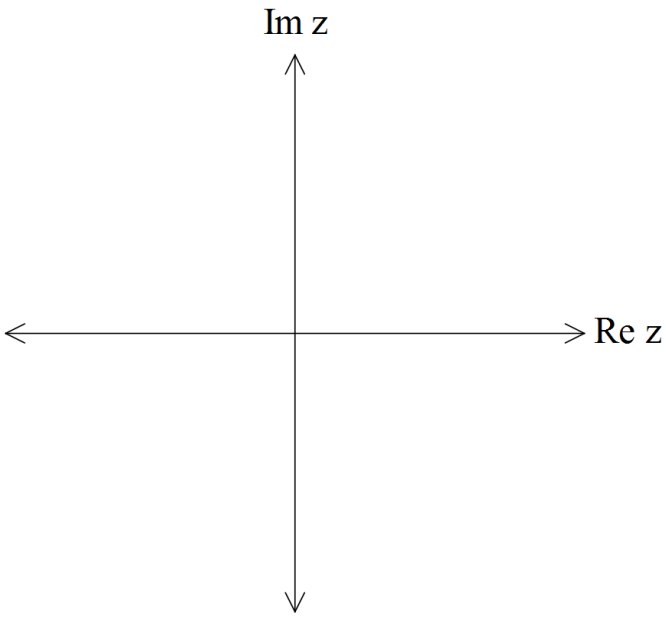
3. (6 marks)

Solve the following equations, stating the roots in polar form and showing them on an Argand diagram:

(a) $z^4 = 4$ [2]



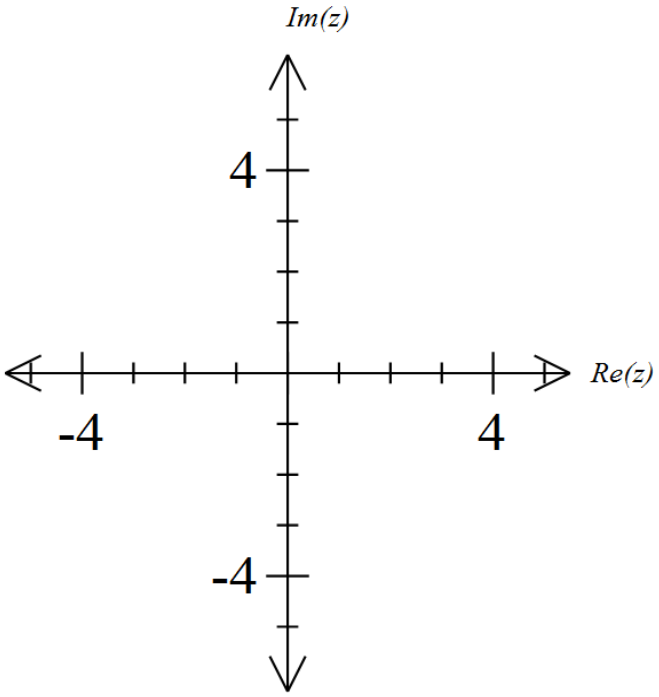
(b) $z^3 + 8i = 0$ [4]



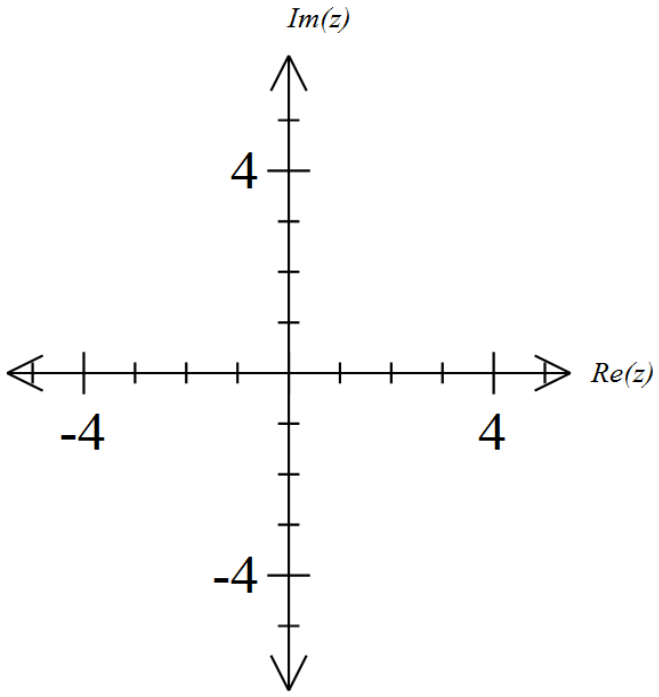
4. (8 marks)

Clearly show the set of points on each Argand diagram defined by:

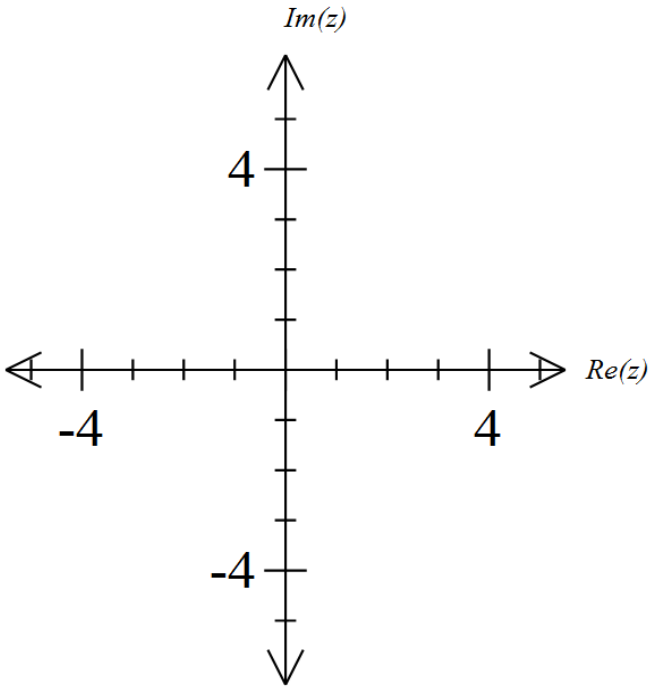
(a) $|z-3-2i|<1$ [3]



(b) $|z+3i|=|z+2-2i|$ [3]



(c) $Arg\, z > \dfrac{-2\pi}{3}$ [2]



5. (4 marks)

Describe, using appropriate notation, the following set of shaded points.