CHAPTER 5

COMPLEX NUMBERS AND QUADRATIC EQUATIONS

IMPROVEMENT 2018

1. Find the polar form of the complex

number
$$\frac{1+i}{1-i}$$
 (3)

2. Find the square roots of the complex number 3+4i.

MARCH 2018

- 3. Consider the quadratic equation $x^2 + x + 1 = 0$
 - a) Solve the quadratic equation. (2)
 - b) Write the polar form of the roots. (2)
 - c) If the two roots of the given quadratic are α

and β , show that $\alpha^2 = \beta$

IMPROVEMENT 2107

- 4. a) The multiplicative inverse of the complex number $3 + 4i = \dots$ (1)
 - b) Express in the Polar form: $z = 1 + i\sqrt{3}$ (2)
 - c) Solve the equation $x^2 + 3x + 5 = 0$ (2)

MARCH 2017

- 5. a) $i^{18} = \dots$ i) 1 ii) 0 iii) -1 iv) *i* (1)
 - b) Represent the complex number $\sqrt{3} + i$ in polar form. (2)
 - c) Find the square root of the complex number -8-6i (3)

IMPROVEMENT 2016

- 6. a) Write the real and imaginary parts of the complex number $-3 + \sqrt{-7}$. (1)
 - b) Find the modulus and argument of the complex number $1 + i\sqrt{3}$ (2)

c) Solve:
$$x^2 - 2x + 3 = 0.$$
 (3)

MARCH 2016

7. a) Which one of the following is the real part and imaginary parts of the complex number:

$$\left(\frac{1+i}{1-i}\right) - \left(\frac{1-i}{1+i}\right)?$$

- b) Express the complex number *i* in the Polar form. (2)
- c) Solve: $\sqrt{5}x^2 + x + \sqrt{5} = 0$ (3)

IMPROVEMENT 2015

8.	a)	What is i^{-35} ?	(1)
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- b) Represent the complex number $\sqrt{3} + i$ in the polar form. (2)
- c) Solve: $\sqrt{5}x^2 + x + \sqrt{5} = 0$. (3)

MARCH 2015

- 9. a) Represent the complex number 1+i√3 in the polar form. (2)
 b) Find the square root of the complex
 - number -7 24i. (4)

IMPROVEMENT 2014

10. a) Solve the quadratic equation: $-x^2 + x - 2 = 0$ (2)

Remesh's Mathematics

b)	Express i in the polar form .		
	$r(\cos\theta + i\sin\theta).$	(3)	

MARCH 2014

11. a) Solve
$$\sqrt{3}x^2 + x + \sqrt{3} = 0$$
 (2)
b) Represent the complex number

 $z = 1 + i\sqrt{3}$ in the polar form. (3)

SEPTEMBER 2013

12. a) Express
$$\frac{1+i}{1-i}$$
 in the form a+ib. (2)

b) Represent
$$\frac{1+i}{1-i}$$
 in polar form. (3)

MARCH 2013

13. a) Represent the complex number $\sqrt{3} + i$ in the polar form. (2)

b) Solve:
$$\sqrt{5}x^2 + x + \sqrt{5} = 0$$
 (3)

SEPTEMBER 2012

- 14. i) Represent the complex number $1+i\sqrt{3}$ in the polar form. (2)
 - ii) Express $\frac{2+i}{2-i}$ in the form a+ib. (3)

MARCH 2012

15. Consider the complex number,
$$Z = \frac{5 - \sqrt{3}i}{4 + 2\sqrt{3}i}$$

- a) Express Z in the form a + ib (2)
- b) Express Z in the polar form. (3)

IMPROVEMENT 2011

16. Consider the equation $z^2 - 2z + 4 = 0$.

- i) Find two complex numbers satisfying this equation. (2)
- ii) Simplify $\frac{z_1}{z_2} + \frac{z_2}{z_1}$ (3)

MARCH 2011

17. Co	nsider the complex number $Z =$	$\frac{2+i}{(1+i)(1-2i)}$
	Express Z in the form a+ib.	(2)
b)	Represent Z in the polar form.	(3)

MARCH 2010

18. i)	Express the complex number $z = \frac{3+i}{2+3i}$	
	in the form $a + ib$	(2)

ii) Represent z in the polar form. (3)

AUGUST 2009

19. i)	Express the complex number	$\frac{3-\sqrt{-16}}{1-\sqrt{-9}}$ in the
	form $a+ib$.	(2)
ii) Represent the complex number $z = 1 + i i$		
	the polar form.	(2)

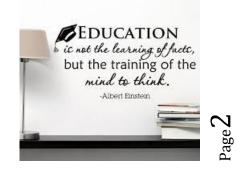
iii) Solve the equation $ix^2 - x + 12i = 0$ (2)

MARCH 2009

20. a) Express the complex number

$$\frac{2-i}{(1-i)(1+2i)}$$
 in the form $a + ib$. (2)

- b) Find the polar from of the complex number $\sqrt{3} + i$ (2)
- c) Solve the quadratic equation: $27x^2 - 10x + 1 = 0$ (2)



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