iliswei Reys		J.1.5								JLL Mail	. 0.40	oou.c
ANSWER	KEYS	marina go	///.	murio go	///.	madiango	///.	matiner go	///.	muniungo	///.	
<b>1.</b> (3) motho <b>9.</b> (1)	2. (2) 10. (6)	3. (3)	14.	<b>4.</b> (1) mathongo	14.	5. (4) mathongo	///.6	. (4) mathongo	7. (4	) 8. mathongo	(1)	math
/// matho												
F:4 6:	d $lpha^2+eta^2$ i $=\lambda-3$ &	in terms of $\lambda$ : $\alpha\beta = -\lambda$										
$lpha^2 + eta^2$	=(lpha+eta)	$^{2}-~2~lphaeta=(\lambda$	<b>-//3</b> )	$(1)^2+2\lambda$								
Now exp	pression is	$\lambda + 2\lambda + 9 = \lambda$ quadratic in term	ns of .	$\lambda$ .								
It will be	e minimum	$at\lambda = \left(-\frac{b}{2a}\right) = 0$	$\rightarrow \lambda =$	$\left(-\frac{(-4)}{2}\right) \Rightarrow$	$\lambda =$	<sup>2</sup> mathongo						
		nathongo										
// mathe	ngo ///	.) mathongo										
// matho	ongo ///.	$\frac{16-36)}{4} = 5 \text{ ; at } 2$										
	-10	mathongo										

## **Basic Question Practice Set 3**

## **Answer Keys and Solutions**

# **Quadratic Equation JEE Main Crash Course**

(2) athongo /// mathongo ///							
According to the question,							
According to the question, Let $\alpha$ is the common root of give	n equation,						
Hence, $\frac{\alpha^2}{b_1c_2-b_2c_1} = \frac{\alpha}{a_2c_1-a_1c_2} = \frac{1}{a_1b_2-a_2b_1}$							
$b_1c_2-b_2c_1$ $a_2c_1-a_1c_2$ $a_1b_2-a_2b_1$ Above formula is used to find the							
Above formula is used to find the $a_1x^2 + b_1x + c_1 = 0$							
$a_1x^2+b_1x+c_1=0 \ a_2x^2+b_2x+c_2=0$							
Now comparing given equations	with above me	ntion	ed standard we	get.			
$a_1=1,\ b_1=b,\ c_1=-1$	THE REPORT GO		Thursday o	501,			
and $a_2=1,\;b_2=1,\;c_2=b$							
Now put the above values in the g			-				
$b^2 - (-1)$ $-1 - b$ $1 - b$							
or $\alpha^2=rac{b^2+1}{1-b}$ (i) and $\alpha=rac{b+1}{b-1}$ (ii)							
Substitute the value of $\alpha$ in equat $\left(\frac{b+1}{b-1}\right)^2 = \frac{b^2+1}{1-b}$	ion (i), we get,						
Solving further we get,							
$b^2+2b+1=b^2-b^3+1-b$							
$egin{aligned} mat & \Rightarrow 3b = -b^3 \ mathongo \end{aligned} egin{aligned} & \Rightarrow b^2 = -3, b = 0 \end{aligned}$							
•							
Hence, $b=0,i\sqrt{3},\;-i\sqrt{3}$							
(3) athongo ///. mathongo ///.							
$2x^2-7x+1=0 \ \Rightarrow x=rac{7\pm\sqrt{41}}{4}$							
∴ First equation has irrational roomath Both the roots will be common	ots. mathongo						
$\Rightarrow \frac{a}{2} = \frac{b}{-7} = \frac{2}{1}$	•						
$\Rightarrow a = 4, b = -14 \text{ ongo}$							

## **Basic Question Practice Set 3**

### **Answer Keys and Solutions**

## Quadratic Equation JEE Main Crash Course

$$^{\prime\prime\prime}$$
 so,common difference =  $\pm 3 or - 3$   $^{\prime\prime\prime}$  mathongo  $^{\prime\prime\prime}$  mathongo  $^{\prime\prime\prime}$  mathongo  $^{\prime\prime\prime}$  mathongo  $^{\prime\prime\prime}$  mathongo  $^{\prime\prime\prime}$ 

5. (4) 
$$e^{\sin x} - e^{-\sin x} - 4 = 0$$

$$\Rightarrow (e^{\sin x}) - 4e^{\sin x} - 1 = 0 \Rightarrow t^2 - 4t - 1 = 0$$
/// mathongo ///

4 
$$\left(x^2+\frac{1}{x^2}\right)+16\left(x+\frac{1}{x}\right)-57=0$$
 mathongo math

$$3 + 4y^2 + 16y - 65 = 0$$
 athongo /// mathongo /// matho

When, 
$$y=\frac{5}{2}$$
 mathongo /// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///

When, 
$$y=-\frac{13}{2}$$
 mathongo /// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo // mathongo /// mathongo // mathongo /

$$\Rightarrow 2x^2+13x+2=0$$

///  $\Rightarrow x=\frac{-13\pm\sqrt{153}}{4}$  mathongo /// mathongo //

Since 
$$x$$
 is rational,  $x=2$  or  $\frac{1}{2}$ 

Whence, their product is 1. Though what mathematically mathematically mathematical mathemat

7. (4) 
$$\alpha + \beta + \gamma = 0$$
,  $\alpha\beta + \beta\gamma + \gamma a = -5$ ,  $\alpha\beta\gamma = -4$ 

## **Basic Question Practice Set 3**

## **Quadratic Equation**

Answer Keys and Solutions		JEE Main Crash Course							
8. (1) athongo /// mathongo ///.									
Since, $\alpha$ , $\beta$ , $\gamma$ are the roots of the equa	tion								
$2x^3 - 3x^2 + 6x + 1 = 0$ $\Rightarrow \alpha + \beta + \gamma = \frac{3}{2} \dots (1)$									
$egin{aligned} &\Rightarrow lphaeta + eta\gamma + lpha\gamma = 3.\dots.(2) \ &\Rightarrow lphaeta\gamma = rac{-1}{2}.\dots.(3) \end{aligned}$	mathongo On s	squari	mathongo ng Eq. (1), we	get					
$lpha^2+eta^2+\gamma^2+2(lphaeta+eta\gamma+\gammalpha)=rac{9}{4} \ lpha^2+eta^2+\gamma^2=rac{9}{4}-2 imes 3=rac{-15}{4}$	Using 6	equati	on (2), we get						
9. (1) Let $e^x = t \in (0, \infty)$ Given equation									
$t^4 + t^3 - 4t^2 + t + 1 = 0$ $t^2 + t - 4 + \frac{1}{t} + \frac{1}{t^2} = 0$ hongo									
$\left(t^2 + \frac{1}{t^2}\right) + \left(t + \frac{1}{t}\right) - 4 = 0$ Let $t + \frac{1}{t} = \alpha$ mathons ///									
$(\alpha^2 - 2) + \alpha - 4 = 0$ $\alpha^2 + \alpha - 6 = 0 \text{ mathongo } \text{///}$									
$lpha^2 + lpha - 6 = 0$ $lpha = -3, 2 \Rightarrow lpha = 2 \Rightarrow e^x + e^{-x} = 2$									
x = 0 only solutions									
10. (6)									
$\left(7+4\sqrt{3} ight)^{x^2-4x+3}+\left(7-4\sqrt{3} ight)^{x^2-4x+3}$ Take									
Put mathons $(7+4\sqrt{3})^{x^2-4x+3} = t$									
$\Rightarrow \left(\frac{7+4\sqrt{3}}{7-4\sqrt{3}} \times \left(7-4\sqrt{3}\right)\right)^{x^2-4x+3} = t$									
$\Rightarrow \left(\frac{1}{7-4\sqrt{3}}\right)^{x^2-4x+3} = t$ $\Rightarrow \left(7-4\sqrt{3}\right)^{x^2-4x+3} = \frac{1}{t}$									
Thus, given equation becomes									
$t+rac{1}{t}=14$									
$ ightarrow t^2 - 14t + 1 = 0 \  ightarrow t = rac{14 \pm \sqrt{\left(14 ight)^2 - 4\left(1 ight)\left(1 ight)}}{2} = 7 \pm 4\sqrt{3}$									
Thus, nongo /// mathongo /// $x^2 - 4x + 3 = 1, -1$									
$\Rightarrow x = 2, \ 2 \pm \sqrt{2}$									