ANSWER KEYS

- 1. (1) 2. (4) 3. (1) 4. (4) 5. (2) 6. (3) 7. (4) 8. (1) mathongo (1) m
- **9.** (1) **10.** (1)
 - mathongo /// math
 - Above inequality will satisfy if wathongo wathon
 - ///. Distinungo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo
 - \Rightarrow $(2a)^2 4(10 3a) < 0_{100000}$ /// mathongo /// mathongo /// mathongo /// mathongo ///
 - $\Rightarrow 4a^2-4(10-3a) < 0$ mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///
 - \Rightarrow $a^2-10+3a<0$ ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///.
 - $\Rightarrow \mathrm{a}^2 + 3\mathrm{a} 10 < 0$
 - ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo
 - $\Rightarrow a^2 + 5a 2a 10 < 0$
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 - 2. (4)
 - As f(x) > 0 /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///

 - For $D < 0 \implies \{2(a-1)\}^2 8(a^2-1) < 0$
 - $\Rightarrow a^2 + 1 2a 2a^2 + 2 < 0$ mathongo /// mathongo // mat
 - $-a^2-2a+3 < 0 \ a^2+2a-3 > 0$
 - (a-1)(a+3)>0 mathongo /// mathongo // mathongo /// mathongo /// mathongo /// mathongo /// mathongo // mathongo /// mathongo // math
 - $a\in (-\infty,-3)\cup (1,\infty)$ & $a\in (-\infty,-1)\cup (1,\infty)$ /// mathongo // matho
 - ///. r<athongs // mathongs /// mathongs ///
 - ///. : $ma \le 3 \text{ or } a > 1$ nathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo
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Answer Kevs and Solutions

3.' (1) athongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. : Quadratic expression is positive, hence 1 + 2m > 0 and D < 0

- $\Rightarrow m > \frac{-1}{2}$ and /// mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///.
- $4(1+3m)^2-16(1+m)(1+2m)<0$
- $\Rightarrow 9m^2+1+6m-4\left(2m^2+3m+1
 ight)<0$ mathongo /// mathongo /// mathongo /// mathongo /// $\Rightarrow m^2 - 6m - 3 < 0$
- $\Rightarrow m \in \left(3-2\sqrt{3},\ 3+2\sqrt{3}
 ight)$
- $\therefore m = 0, 1, 2, 3, 4, 5, 6$ \therefore Number of integral values = 7
- 4. (4)

Since, α and β are the roots of $4x^2 - 16x + \lambda = 0$, $\lambda \in R$ such that $1 < \alpha < 2$ and $2 < \beta < 3$.

- // mat/Therefore, we havehongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///
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- α athona x mathong x mathong x mathong x mathong x
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Clearly,

- $\mathsf{mat}(f(1)>0,\ f(2)<0,\ f(3)>0$ /// $\mathsf{mathongo}$ // $\mathsf{mathongo}$ /// $\mathsf{mathongo}$ // $\mathsf{mathongo}$ $f(1) = -12 + \lambda > 0 \Rightarrow \lambda > 12$
- $f(2)=-16+\lambda<0\Rightarrow \lambda<16$ mathongo /// mathongo /// mathongo /// mathongo ///
- $f(3) = -12 + \lambda > 0$
- $\Rightarrow 16(16 \lambda) > 0$
 - $\therefore \ \lambda \in \{13,14,15\}.$
- mat Hence, three integral solutions." mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///
- $\frac{1}{a-1-1}\frac{1}{3}\frac{1}{a^2+2}$ mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///.

- a-1<-1 and $a^2+2>3$ mg $^{\prime\prime\prime}$ mathong $^{\prime\prime\prime}$ mathong $^{\prime\prime\prime}$ mathong $^{\prime\prime\prime}$ mathong $^{\prime\prime\prime}$ mathong $^{\prime\prime\prime}$
 - a<0 and $a^2>1$
- a < 0 and a > 1 or $a < \pm 1$ ongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. $\Rightarrow a < -1$

Basic Question Practice Set 2

Answer Kevs and Solutions

Quadratic Equation JEE Main Crash Course

$$x^2-(m-1)x-(m+1)x+m^2-1=0$$
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$$\Rightarrow x(x-m-1)-(m-1)(x-m-1)=0$$
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$$\Rightarrow (x-m-1)(x-m+1)=0$$
/// mathongo ///

$$\Rightarrow$$
 either $x = m - 1$ or $x = m + 1$.

By given condition
$$-2 < m - 1 < m + 1 < 4$$

7. (4) Let,
$$f(x) = 4x^2 - 20kx + (25k^2 + 15k - 66) = 0 \dots (i)$$

Let the roots of
$$f(x)=0$$
 be $lpha,\ eta$ mathong with mathon w

Since
$$\alpha$$
, β are real.

$$\Delta \geq 0$$

We have
$$lpha,\ eta < 2$$
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///.
$$\mbox{mathongo} \mbox{ } \mbox{ } \mbox{ } \mbox{ } \mbox{mathongo} \mbox{ } \mbox{ }$$

$$\implies$$
 $3 \pm \frac{(-20k)}{4} < 4 \implies k < \frac{4}{5} + \dots + \frac{4}{5} + \dots + \dots + \frac{1}{5} = 1 + \dots + \frac{1}{5} + \dots + \frac{1$

///
$$f(x)$$
 = $4(x-lpha)(x-eta)$ thongo /// mathongo /// mathongo /// mathongo /// mathongo ///

$$\therefore f(2) = 16 - 40k + \left(25k^2 + 15k - 66\right) > 0$$

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$$\Rightarrow 25k^2 - 25k - 50 > 0 \ \ \Rightarrow \ k^2 - k - 2 > 0$$

$$\Rightarrow (k+1)(k-2) > 0 \Rightarrow k < -1 ext{ or } k > 2 \dots \dots (iv)$$

Answer Kevs and Solutions

- 8. (1) Both roots are less than 3 190 // mothongo // mothongo // mothongo // mothongo // mothongo // $\Rightarrow D \geq 0, -\frac{B}{2A} < 3, \ f(3) > 0$
 - $D=4a^2-4ig(a^2+a-3ig)=-4(a-3)\geq 0$ athongo we mathongo we mathon which we will be a superior of the sup
- $\Rightarrow a \leq 3 \dots (i)$
- $\frac{-B}{2A}=rac{2a}{2}=a<3\ldots(ii)$ ongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. matho $f(3) = 9 - 6a + a^2 + a - 3 > 0$
 - $a^2 5a + 6 > 0$ $(a-2)(a-3)>0\Rightarrow a<2 ext{ or }a>3\dots.(iii)$ mathongo /// mathongo /// mathongo ///
- Taking the intersection of (i), (ii), (iii), we get,
- a < 2hongo /// mathongo ///
- 9. (1) Clearly, f(-1)>0, f(2)<000 /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo ///
- // mathorigo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo
- mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo
- since, f(0) = -4 < 0
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- mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo
- and 4 + 2a 4 < 0mathongo /// mathongo ///
- $\Rightarrow a < 0$
 - Hence, $a \in (-\infty, -3)$.
- 10. (1) athongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// $ax^2 + 2bx - 3c = 0$ has no real roots
- f(2) = 4a + 4b 3c $=4\left(a+b-\frac{3c}{4}\right)>0$ (given)
- So, $f(x) > 0 \ \forall x$ x ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo
- $\Rightarrow f(0) > 0$
- $\Rightarrow -3c > 0 \Rightarrow c < 0$