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MATHEMATICS CLASS X (SA-2)

QUADRATIC EQUATION

Q.1	Solve for x using formula : (i) $9x^2-3x-2=0$ (i) $6x^2-\sqrt{2}\,x-2=0$.
Q.2	Solve for x(i) $x^2=18x-65$ (ii) $9x^2-3(a+b)x+ab=0$.
Q.3	Solve for x using formula: $3x^2-2x-1=0$.
Q.4	Solve the quadratic equation using factorization: $4x^2+23x=-15$.
Q.5	Solve the quadratic equation making a perfect square $42x^2-17x+1=0$.
Q.6	Solve for x: $4x^2+13x=35$.
Q.7	Solve the quadratic equation making a perfect square $3x^2+7x=150$.
Q.8	Solve : $\frac{a}{ax-1}+\frac{b}{bx-1}=a+b$.
Q.9	Solve for x: $a^2b^2x^2+b^2x-a^2x-1=0$.
Q.10	Solve for x(i) $12abx^2-(9a^2-8b^2)x-6ab=0$ (ii) $36x^2-12ax+(a^2-b^2)=0$.
Q.11	Find the nature of roots of the quadratic equation $\sqrt{2}x^2-\frac{3}{\sqrt{2}}x+\frac{1}{\sqrt{2}}=0$.
Q.12	Solve (i) $x^2-x+\frac{1}{4}=0$.(ii) $10ax^2+15ax-6x-9=0,\ a\neq 0.$
Q.13	An express train takes 1 hour less than a passenger train to travel 132 km between stations A and B (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/ hour more than that of the passenger train, find the average speed of the two trains.
Q.14	Solve for x : $\frac{1}{x-3}-\frac{1}{x+5}=\frac{1}{6}$ (ii) $\frac{2x-3}{x-1}-\frac{4(x-1)}{2x-3}=3;x\neq 1,\frac{3}{2}$
Q.15	Solve for x: $\frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x};x\neq 0,a\neq 0,b\neq 0 and x\neq -(a+b)$
Q.16	Solve ☹i) $\frac{a}{x-b}+\frac{b}{x-a}=2,x\neq b and x\neq a$ (ii) $\frac{x+1}{x-1}+\frac{x-2}{x+2}=3(x\neq 1,-2)$.
Q.17	The sum of ages of father and his son is 45 years. 5 years ago, the product of their ages was 124. Determine their present ages.
Q.18	Solve for x : $\frac{x+1}{x-1}+\frac{x-2}{x+2}=3;\ x\neq 1,-2$
Q.19	Solve for x : $a(a^2+b^2)x^2+b^2x-a=0$.
Q.20	Using quadratic formula, solve the following quadratic equation for x: $x^2-4ax+4a^2-b^2=0$
Q.21	Using the quadratic formula, solve the equation : $a^2b^2x^2-(4b^4-3a^4)x-12a^2b^2=0$
Q.22	Solve using quadratic formula : $9x^2-9(a+b)x+(2a^2+5ab+2b^2)=0$
Q.23	Using quadratic formula, solve the following quadratic equation for x: $p^2x^2+(p^2-q^2)x-q^{\ 2}=0$.
Q.24	Solve for x: $\frac{x-1}{x+1}+\frac{x-3}{x-4}=\frac{10}{3},x\neq -2,4$
Q.25	Using quadratic formula solve for x: $\frac{1}{x+1}+\frac{2}{x+2}=\frac{4}{x+4},x\neq 1,-2,-4$
Q.26	Using quadratic formula solve for x: $p^2x^2+(p^2-q^2)x-q^2=0$.
Q.27	From a quadratic equation whose roots are $\frac{3-\sqrt{3}}{5}$ and $\frac{3+\sqrt{3}}{5}$.
Q.28	Find the roots of the equation $5x^2-6x-2=0$ by the method of completing the square.
Q.29	By using the method of completing the square, show that the equation $4x^2+3x+5=0$ has no real roots.
Q.30	Solve the equation $2x^2-5x+3=0$ by the method of completing square. .
Q.31	Solve : $\frac{1}{(x-1)(x-2)}+\frac{1}{(x-2)(x-3)}+\frac{1}{(x-3)(x-4)}=\frac{1}{6}$.
Q.32	Solve: $ax^2+(4a^2-3b)x-12ab=0$.

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Q.33	Solve: $4x^2+4bx-(a^2-b^2)=0$.
Q.34	Solve the following quadratic equation by factorization method: (i) $4x^2-2(a^2+b^2)x+a^2b^2=0$ (ii) $x^2+x-(a+1)(a+2)=0$ (iii) $x^2+3x-(a^2+a-2)=0$ (iv) $x^2-4ax+4a^2-b^2=0$.
Q.35	Solve:(i) $\frac{4}{x}-3=\frac{5}{2x+3}, x\neq 0,-\frac{3}{2}$ (ii) $\frac{2x}{x-3}+\frac{1}{2x+3}+\frac{3x+9}{(x-3)(2x+3)}=0$ (iii) $\frac{x}{x+1}+\frac{x+1}{x}=\frac{34}{15}, x\neq 0, x\neq -1$ (iv) $\frac{x+3}{x-2}-\frac{1-x}{x}=\frac{17}{4}$ (v) $3x^2-2\sqrt{6}\,x+2=0$
Q.36	If a and c are such that the quadratic equation a x^2 -4x+c=0 has 8 as the sum of the roots and also as the product of the roots ,find a and c.
Q.37	Solve the following quadratic equation by factorization method: (i) $x^2+2\sqrt{2}x-6=0$ (ii) $\sqrt{3}x^2+10x+7\sqrt{3}=0$.
Q.38	Solve : (i) $x=\dfrac{1}{2-\dfrac{1}{2-\dfrac{1}{2-x}}}, x\neq 2$.(ii) $x=3+\dfrac{1}{3+\dfrac{1}{3+\ldots\ldots\ldots\ldots\ldots}}$ (iii) $x=\dfrac{1}{4+\dfrac{1}{4+\dfrac{1}{4+\ldots\ldots\ldots\ldots\ldots}}}$ (iv) $x=\sqrt{6+\sqrt{6+\sqrt{6+\ldots\ldots\ldots\infty}}}$.
Q.39	Solve for x : $\left(\frac{4x-3}{2x+1}\right)-10\left(\frac{2x+1}{4x-3}\right)=3,\ x\neq -\frac{1}{2},\frac{3}{4}$.
Q.40	Solve for x : $10ax^2-6x+15ax-9=0,\ a\neq 0$.
Q.41	Find the nature of roots of each of the following quadratic equation: (i) $2x^2+5\sqrt{3}x+6=0$ (ii) $2x^2-6x+3=0$ (iii) $9x^2-6x+1=0$ (iv) $x^2-x+2=0$ (v) $9x^2+7x-2=0$ (vi) $(x+3)(x-1)=3\left(x-\frac{1}{3}\right)$ (vii) $\frac{4}{x}-3=\frac{5}{2x+3}, x\neq 0, \frac{-3}{2}$.
Q.42	Solve the following quadratic equation by the method of completing the square: $2x^2-9x+10=0$. .
Q.43	Using quadratic formula, solve for x: $9x^2-3(a+b)x+ab=0$

Q.44	Solve for x:(x+4) (x+5) =3 (x+1) (x+2) +2x
Q.45	If the roots of the equation $(a-b)x^2+(b-c)x+(c-a)=0$ are equal, prove that 2a = b + c.
Q.46	Find the value of c for which the quadratic equation $4x^2-2(c+1)x+(c+4)=0$ has equal roots.
Q.47	Find the value of p for which the quadratic equation $2px^2-8x+p=0$ has equal roots.
Q.48	Find the value of k if the equation $k^2x^2-2(2k-1)x+4=0$ has equal roots.
Q.49	Find the value of k for which the quadratic equation $(k+4)x^2+(k+1)x+1=0$ has equal roots.
Q.50	Determine values of p for which the quadratic equation $x^2+px+1=0$ has real roots.
Q.51	Find the value of α such that the equation $(\alpha-12)x^2+2(\alpha-12)x+2=0$ has equal roots.
Q.52	Find the value of k so that the quadratic equation $x^2-2kx+7k-12=0$ has equal roots.
Q.53	Determine value (s) of p for which the quadratic equation $4x^2-3px+9=0$ has real roots. If the equation $(1+m^2)x^2+2mcx+(c^2-a^2)=0$ has equal roots, prove that $c^2=a^2(1+m^2)$.
Q.54	Find the value of α such that the equation $(\alpha-4)x^2+2(\alpha-4)x+4=0$ has equal roots.
Q.55	Form a quadratic equation with rational coefficients, one of whose roots is $\frac{2-\sqrt{3}}{5}$.
Q.56	If α,β are the roots of the quadratic equation $x^2+5x+1=0$,find the value of if $\alpha^2+\beta^2+\alpha\beta$.
Q.57	For the quadratic equation $(k-1)x^2=kx-1$, find k , so that one root is -3 .
Q.58	Solve the following quadratic equations:(i) $(a+b)^2x^2-(a+b)x-6=0, (a+b\neq 0)$.

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Q.59	If one root of a quadratic equation $3x^2 + px + 4 = 0$ is $\frac{2}{3}$, find the other root of the equation and the value of p.
Q.60	The zeros of a quadratic equation $2x^2 + x + m = 0$ are $\alpha and \beta$. find the value of m if $\alpha^2 + \beta^2 + \alpha\beta = \frac{13}{4}$.
Q.61	The zeros of a quadratic equation $x^2 - 7x + k = 0$ are $\alpha and \beta$ such that $\alpha - \beta = 3$. find the value of k.
Q.62	If one zero of quadratic equation $3x^2 = 8x + 2k + 1$ is seven times the other, then find the zeroes and value of k.
Q.63	A quadratic equation has two zeros namely $\alpha and \beta$. find quadratic equation if $(\alpha + \beta) = 19$ and $(\alpha - \beta) = 5$.
Q.64	If $\alpha \& \beta$ are the zeroes of the quadratic equation $x^2 + 4x + 3 = 0$ form the quadratic equation whose zeroes are $\frac{1}{2\alpha + \beta}$ & $\frac{1}{\alpha + 2\beta}$.
Q.65	The zeros of a quadratic equation $x^2 - 5x + k = 0$ are $\alpha and \beta$ such that $\alpha - \beta = 1$. find the value of k.
Q.66	If $\alpha \& \beta$ are the zeroes of the quadratic equation $x^2 + 3x - 10 = 0$ form the quadratic equation whose zeroes are $\frac{\beta^2}{\alpha}$ & $\frac{\alpha^2}{\beta}$.
Q.67	If the roots of the equation $3x^2 - (4k + 3)x + 5 = 0$ is equal in magnitude but opposite in sign. Find k.
Q.68	Find the value of k so that quadratic equation $x^2 - (k + 6)x + 2(2k - 1) = 0$ has sum of the roots equal to half of their product.
Q.69	Write a quadratic polynomial, sum of whose zeroes is $2\sqrt{3}$ and their product is 12.
Q.70	Find the value of k for which the equation $kx(x - 2) + 6 = 0$ has equal roots.
Q.71	The sum of a number and its positive square root is $\frac{6}{25}$. Find the number.
Q.72	For what values of k will the following equations have a repeated root ? $4x^2 - 2(k + 1)x + (k + 4) = 0$.

Q.73	From a quadric equation, one of whose roots is $2 + \sqrt{5}$ and sum of the roots is 4 .
Q.74	If $\alpha + \beta = 3$ and $\alpha^3 + \beta^3 = 7$, then prove that $\alpha \& \beta$ are the root of equation $9x^2 - 27x + 20 = 0$.
Q.75	If α, β are the roots of the equation $x^2 - 3x + 2 = 0$, then the equation whose roots are $(\alpha + 1)$ and $(\beta + 1)$.
Q.76	If $\alpha \& \beta$ are roots of the equation $2x^2 - 5x + 7 = 0$, find the value of $(2\alpha + 3\beta)(3\alpha + 2\beta)$.
Q.77	Determine the value of m for which the equation $5x^2 - 4x + 2 + m(4x^2 - 2x - 1) = 0$ will have (a) equal roots, (b) product of roots as 2, (c) sum of roots as 6.(d) equal in magnitude but opposite in sign (e) one roots is reciprocal of the other .
Q.78	If one zero of the quadratic polynomial $f(x) = 4x^2 - 8kx - 9$ is negative of the other , find the value of k .
Q.79	Two numbers m & n are such that the quadratic equation $mx^2 + 3x + 2n = 0$ has - 6 as the sum of the roots & also as the product of the roots. Find m & n .
Q.80	The denominator of a fraction is 1 more than twice the numerator. The sum of the fraction and is reciprocal is $2\frac{16}{21}$ .Find the fraction .
Q.81	One root of the equation $2x^2 - 8x + m = 0$ is 5/2. Find the other root and the value of m .
Q.82	If x = 2 and x = 3 are the roots of the equation $3x^2 - 2kx + 2m = 0$, find the values of k and m.
Q.83	The equation $5x^2 + (9 + 4m)x + 2m^2 = 0$ & $5x + 9 = 0$ are satisfied by the same value of x . Find the value of m .
Q.84	A two-digit number is such that the product of its digits is 18. when 63 is subtracted from the number, the digits interchange their places. Find the number. .
Q.85	A number consists of two digits whose product is 18. when 27 is subtracted from the number, the digits change their places. Find the number. .
Q.86	A two-digit number is four times the sum and three times the product of its digits. Find the number. .

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Q.87	A two-digit number is four times the sum of its digits and twice the product of the digits. Find the number. .
Q.88	The sum and the product of the roots of the quadratic equation $4mx^2+4nx+3=0$ are $\frac{1}{2}and\frac{3}{16}$ respectively. Determine the value of m and n.
Q.89	If $\sin\theta$ and $\cos\theta$ are the roots of the quadratic equation $ax^2+bx+c=0$, then prove that $a^2+2ac=b^2$.
Q.90	If the ratio of the roots of the quadratic equation $lx^2+nx+n=0$ is $\alpha:\beta$, then prove that $\sqrt{\frac{\alpha}{\beta}}+\sqrt{\frac{\beta}{\alpha}}+\sqrt{\frac{n}{l}}=0$.
Q.91	The sum of the squares of two consecutive positive integers is 421. find the integers.
Q.92	Two numbers differ by 3 and their product is 504. find the numbers.
Q.93	Two numbers differ by 4 and their product is 192. find the numbers.
Q.94	The sum of two numbers is 18 and the sum of their reciprocals is $\frac{1}{4}$. Find the numbers.
Q.95	A fast train takes 3 hours less than a slow train for a journey of 600 km. If the speed of the slow train was 10 km/hr less than that of the fast train, find the speeds of the trains.
Q.96	The sum of two numbers a and b is 15 and the x sum of their reciprocals $\frac{1}{a}$ and $\frac{1}{b}$ is $\frac{3}{10}$. Find the numbers a and b. ?
Q.97	The product of two consecutive even integers is 288. find the integers. .
Q.98	Find two consecutive multiples of 3 whose product is 270. .
Q.99	The difference of the squares of two positive integers is 45. the square of the smaller number is 4 times the larger number. Determine the numbers. .
Q.100	The sum of the squares of two positive integers is 208. if the square of the larger number is 18 times the smaller number, find the numbers. .
Q.101	There are three consecutive positive integers such that the sum of the squares of the first and the product of the other two is 277. find the integers. .
Q.102	The sum S of first n natural numbers is given by the relation $s=\frac{1}{2}n(n+1)$. Find n if the sum is 528. .
Q.103	The sum of n successive odd natural numbers starting from 3 is given by the relation s= n(n+2). Determine n, when s =323. .
Q.104	Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the square of the other two by 60. find the numbers. .
Q.105	The sum of the numerator and the denominator of a fraction is 8. if 3 is added to both the numerator and the denominator, the fraction becomes $\frac{3}{4}$. Find the fraction. .
Q.106	The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.
Q.107	A plane left 30 minutes later than the schedule time and in order to reach its destination 1500 km away in time, it has to increase its speed by 250 km/h from its usual speed. Find its usual speed.
Q.108	Two Pipes running together can fill a tank in 6 minutes. If one pipe takes 5 minutes more than the other to fill the tank, find the time in which each pipe would fill the tank separately.
Q.109	Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.
Q.110	The denominator of a fraction exceeds its numerator by 3. if I is added to both the numerator and the denominator, the difference between the new and the original fraction is $\frac{1}{24}$. Find the original fraction. .
Q.111	The sum of the numerator and the denominator of a fraction is 10. I f I is subtracted from both the numerator and the denominator, the fraction is decreased by $\frac{2}{21}$. Find the fraction. .

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Q.112	A two digit number is such that the product of the digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the numbers.
Q.113	Sum of the areas of two squares is $468m^2$. if the difference of their perimeters is 24m, find the sides of the two squares. .
Q.114	The difference of the squares of two numbers is 45. the square of the smaller number is 4 times the larger number. Determine the numbers. .
Q.115	A two-digit number is such that the product of its digits is 35. when 18 is added to the number, the digits interchange their places. Find the number. .
Q.116	A two-digit number is such that the product of its digits is 14. if 45 is added to the number, the digits interchange their places. Find the number. .
Q.117	The denominator of a fraction is one more than twice the numerator. If the sum of the fraction and its reciprocal is $2\frac{16}{21}$. Find the fraction. .
Q.118	A two – digit number is four times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number. .
Q.119	A two-digit number is seven times the sum of its digits and is also equal to 12 less than three times the product of its digits. Find the number. .
Q.120	A two-digit number is such that the product of its digits is 15. if 18 is added to the number, the digits interchange their places. Find the number. .
Q.121	The sum of the numerator and the denominator of a fraction is 8. if 3 is added to both the numerator and the denominator, the fraction becomes $\frac{3}{4}$. Find the fraction. .
Q.122	The denominator of a fraction exceeds its numerator by 3. if I is added to both the numerator and the denominator, the difference between the new and the original fraction is $\frac{1}{24}$. Find the original fraction. .
Q.123	The sum of the numerator and the denominator of a fraction is 10. I f I is subtracted from both the numerator and the denominator, the fraction is decreased by $\frac{2}{21}$. Find the fraction. .
Q.124	A cottage industry produces a certain number of pottery articles in a day. It was object on a particular day that the cost of production of each article was three more than twice the number of article produce on that day. If the total cost of production on that day was rs. 90, find the number of articles produced and the cost of each articles.
Q.125	In a classs test , the sum of shefali's marks in mathematics and English is 30. had she got 2 marks more in mathematics and three marks in English, the product of the marks would have been 210. find her marks in the two subjects.
Q.126	The diagonal of a rectangular field is 60 meters more than the shorter side. If the longer sideis 30 meters more than the shorter side, find the side of the field.
Q.127	The hypotenuse of a right angled triangle is $3\sqrt{10}$ cm. if trhe smaller leg is tripped and the longer legged is doubled, new hypotenuse will be $9\sqrt{5}$ cm. how long are the legs of the triangle?
Q.128	Seven year ago , varun's age was five time the square of swati's age..three year hence swati age will be two fifth of varun age. Find the present age.
Q.129	The sum of the age of father and his sons is 45 year. Five year ago the, the product of their age was 150. find their present age.
Q.130	Two year ago, a man"s age was three times the square of the son's age. After 3 year , his age will be four times his son's age find this present age.
Q.131	The speed of boat in still water is 11 km/hr . it can go 12km . upstream and return downstream to the original point in 2 hr. 45 min. find the speed of the stream.
Q.132	If the list price of book is reduced by rs. 5, a reson can buy 5 more book for rs. 300 . find the original price list of the book.
Q.133	If the list price of toy is reduced by rs. 2 a person can buy 2 toys more for rs. 360. find the original price of the toy.
Q.134	Rs. 6500 were divided equally among a certain number of persons. Had there been 15 more persons., each would have got rs.30 less. Find the original number of persons. Rs. 9000 were divider equally among a certain number of persons. Had there been 20 more persons, each would have got rs. 160 less. Find the original number of persons.
Q.135	A takes 6 days less than B to do a piece of work . if both A and B working together can do it in 4 days , how many days will B take to finish it ?
Q.136	A farmer wishes to grow a $100m^2$ rectangular vegetable garden. Since he has with him only 30m barbed wire , he fences three sides of the rectangular

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	garden letting compound wall of his house act as the fourth side-fence . find the dimensions of his garden.
Q.137	Some student planned a picnic . the budget for food was rs.500 but, 5 of these failed to go and thus the cost for each member increased by rs.5 how many student attend the picnic?
Q.138	A passenger train takes 3 hour less for a journey of 360 km. if its speed is increased by $10\,km/\ hr$ from its usual speed. What is its usual speed?
Q.139	If I walked $1\,km/\ hr$ faster, I would have taken 15 minutes less to walk 3 km. find the rate of my walking. a train travel a distance of 300 km. at a uniform speed. If the speed of train is increased by 5 km an hour, the journey would have taken 2 hour less. Find he original speed of the train.
Q.140	Two pipes running together can fill a cistern in 6 minutes. If one pipe take 5 minutes more than the other to fill the cistern, find the time in which each pipe would fill the cistern.
Q.141	The length of the hypotenuse of a right triangle exceeds the length of its base by 1 cm and exceed twice the length of the altitude by 3 cm.find the length of each side by of the triangle. ?
Q.142	The speed of a boat in still water is 15 km per hour. It can go30 km upstream and return downstream to the downstream to the original point in 4 hour 30 minutes. Find the speed of the stream.
Q.143	The hypotenuse of a right – angle triangle is 6 m more than the twice the shortest side. If the third side is 2m less than the hypotenuse, find the side of the triangle. ?
Q.144	Ram can row a boat at 8km. downstream an return in 1 he 40 minutes. If the speed of the stream be $2\,km/\ hr$, find the speed of boat in still water.
Q.145	Hari can row a boat at 5km/hr in still water . if it takes him I hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the stream.
Q.146	Out of the number of saras birds. $\frac{1}{4}$th of the number are moving about in lots , $\frac{1}{9}$th coupled with $\frac{1}{4}$th as well as 7 times the square root of the number move on a hill and 56 birds remain in the vakula trees. What is the total umber of birds?

Q.147	One – forth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to mountains and remaining 15 camels were seen on the bank of a river. Find the total number of camels.
Q.148	A swimming pool is filled with three pipes with uniform flow. The first two pipes operating simultaneously, fill the pool in same time during which the pool is filled by the third pipe alone. The seconds pipe fills the pool five hours faster than the first pipe and four hours slower than the third pipe. Find the time required by each pipe to fill the pool separately.
Q.149	By reduction of Rs1 per kg in the price of onions , Beena can buy one kg onions more for Rs 56 .Find the original price of the onions per kg .
Q.150	If twice the area of a smaller square is subtracted from the area of a larger square, the result is 14 sq cm. However, if twice the area of the larger square is added to three times of area of the smaller square, the result is 203 sq cm. Determine the sides of the two squares.
Q.151	A piece of cloth costs Rs.35 if the piece were 4m longer and each meter costs Re .1 less the cost would remain unchanged .How long is the piece ?
Q.152	A train travels 360 km at a uniform speed. If the speed had been 5km/hr more, it would have taken 1 hour less for the same journey. Find the speed of the train.
Q.153	A peacock is sitting on the top of a pillar , which is 9 m high . From a point 27 m away from the bottom of the pillar , a snake is coming to its hole at the base of the pillar . Seeing the snake the peacock pounces on it . If their speed are equal , at what distance from the whole is the snake caught ?
Q.154	A shopkeeper buys a number of books for Rs 80.If he had thought 4 more books for the same amount, each book would have cost Re. 1 less. How many books did he buy?
Q.155	A motor boat whose speed is 18 km/hr in still water takes 1 hr. more to go 24 km upstream than to return downstream to the same spot. Find the speed of stream.
Q.156	B is a point in the line segment AC such that it lies between A and C . if AB=9cm and $AB \times AC = 12\,(BC)^2$, Find BC.
Q.157	A fox and an eagle lived at the top of a cliff of height 6 m , whose base was at a distance of 10 m from a point A on the ground . The fox descends the cliff and went straight to the point A . The eagle flew vertically up to a height x meters and then flew in a straight line to the point A , the distance traveled by

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	each being the same . Find the value of x .
Q.158	A factory kept increasing its output by the same percentage every year .Find the percentage if it is known that the output is doubled in the last two years.
Q.159	A man rowing at the rate of 5 km/hr in still water takes thrice as much time in rowing 40 km up the river as in 40 km down . Find the rate at which the river flows.
Q.160	Some students planned a picnic. The budget for food was Rs.500. But 5of these failed to go and thus the cost of food for each student increased by Rs. 5. How many students attended the picnic .
Q.161	Sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares.
Q.162	Some students arranged a picnic. The total budget for food was Rs. 240. Because four students of the group failed to go, the cost of food to each student got increased by Rs. 5. How many students went for the picnic ?
Q.163	The speed of a boat in still water is 11km/hour. It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes. Find the speed of the stream.
Q.164	If the equations $5x^2+(9+4p)x+2p^2=0$ and $5x+9=0$ are satisfied by the same value of x, find the value of p.
Q.165	A factory produces certain pieces of pottery in a day. It was observed on a particular day that the cost of production of each piece (in rupees) was 3 more than twice the no. of articles produced in the day. If the total cost of production on that day was Rs. 90, find the no. of pieces produced and cost of each piece.
Q.166	A two digit number is four times the sum of its digits. It is also equal to three times the product of its digits. Find the number.

(M.C.Q.) QUADRATIC EQUATION

Q.1	The positive root of $\sqrt{3x^2+6}=9$ is : (A) 3 (B) 4 (C) 5 (D) 7
Q.2	Which of the following is a solution of the quadratic equation $x^2-b^2=a(2x-a)$? (A) $a+b$ (B) $2b-a$ (C) ab (D) $\frac{a}{b}$
Q.3	The raito of the sum and product of the roots of $7x^2-12x+18=0$ is (a) 7 : 12 (b) 2 : 3 (c) 3 : 2 (d) 7 : 18
Q.4	The values of 'k' for which the equation $2x^2-(k-1)x+8=0$ will have real and equal roots are (A) 9 and −7 (B) only 9 (C) only −7 (D) −9 and −7
Q.5	The roots of the equation $x^2-\sqrt{3}x-x+\sqrt{3}=0$ are : (A) $\sqrt{3}, 1$ (B) $-\sqrt{3}, 1$ (C) $-\sqrt{3}, -1$ (D) $\sqrt{3}, -1$
Q.6	Which of the following equation can not be written in the form of $ax^2+bx+c=0$, (a) $(x+2)^3=x^3-4$ (b) $x(2x+3)=x^2+1$ (c) $x(x+1)+8=(x+2)(x-2)$ (d) $(x-2)^2+1=2x-3$
Q.7	One of the roots of the quadratic equation $6x^2-x-2=0$ is : (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) $-\frac{2}{3}$ (D) -1
Q.8	The discriminant of the quadratic equation $ax^2-4ax+(2a+1)=0$ (a) 4a (2a + 1) (b) 2a (2a + 1) (c) 4a (2a – 1) (d) 2a (4a – 1)
Q.9	The value of p so that $x^2+5px+16=0$ has no real roots (a) $p \rangle \frac{8}{5}$ (b) $p \langle -\frac{8}{5}$ (c) $\frac{-8}{5} \langle p \langle \frac{8}{5}$ (d) none of these .
Q.10	If α, β are the roots of the equation $x^2-3x+2=0$, then the equation whose roots are $(\alpha+1)$ and $(\beta+1)$ is : (a) $x^2+5x+6=0$ (b) $x^2-5x-6=0$ © $x^2+5x-6=0$ (d) $x^2-5x+6=0$
Q.11	In the equation $11=y^2+11k-5$. for what value of k will to get real roots? (a) 5.5 (b) 0 (c) 1 (d) -1
Q.12	The roots of the equation $x^2-2\sqrt{3}x+3=0$ are: (a) rational and unreal (b) irrational and unequal (c) rational and equal (d) real and equal

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Q.13	Let $ax^2+bx+c=0,$ where a,b,c are all positive, then both the roots of the equation: (a) are real and positive (b) are real and negative (c) are irrational (d) none of these
Q.14	If the roots of the equation $kx^2+2kx-5=0$ are equal, then the value of k is: (a) $\frac{1}{5}$ (b) -5 (c) 1 (d) 5
Q.15	The perimeter of a rea^2 ctangle is 48m & its area is 135m^2. the sides of a parallelogram are: (a) 15m,9m (b) 19m,5m (c) 45m,3m (d) 27m,5m
Q.16	The set values of k, for which $x^2+5kx+16=0$ has no real root is: (a) $k\geq\frac{8}{5}$ (b) $k\leq\frac{8}{5}$ (c) $-\frac{8}{5}<k<\frac{8}{5}$ (d) $-8<k<8$
Q.17	If $x^2-xy=0.$ which of the following is correct conclusion: (a) x = 0 (b) x = y (c) $x^2=y$ (d) either x = 0 or x = y
Q.18	If r=3 is a root of quadratic equation $kr^2-kr-3=0$ value of k is : (A) $\frac{1}{2}$ (B) 2 (C) -2 (D) $-\frac{1}{2}$
Q.19	Find a if $a-3=\frac{10}{a}$ (a) 5, - 2 (b) $-\sqrt{7},7$ © $\sqrt{7},7$ (d) – 5 , 2
Q.20	$(x^2+1)^2-x^2=0$ has (a) four real roots (b) two real roots © No real roots (d) one real roots
Q.21	The common roots of the equation $x^2-7x+10=0$ & $x^2-10x+16=0$ is (a) - 2 (b) 2 (c) 3 (d) 5
Q.22	If α,β are the roots of the equation $x^2+kx+12=0$ such that $\alpha-\beta=1$, the value of k is : 0 (b) ±5 (c) ±1 (d) ±7
Q.23	If α , β , are the roots of equation $x^2-8x+p=0$ and $\alpha^2+\beta^2=40$ then p is equal to (a) 8 (b) 10 © 12 (d) 14
Q.24	If α and β are roots of $x^2+5x+a=0$ and $2\alpha+5\beta=-1,$ then a is equal to (a) 5 (b) 3 (c) -20 (d) -24

Q.25	For the quadratic equation $x^2-2x+1=0$ the value of $x+\frac{1}{x}$ is (a) – 1 (b) 1 (c) - 2 (d) 2
Q.26	If one roots of the equation $px^2-14x+8=0$ is six times the other, then p is equal to (a) 2 (b) 3 (c) 1 (d) none of these
Q.27	If the roots of the equation $12x^2+mx+5=0$ are in the ratio 3:2, then m equals (a) $\frac{1}{12}$ (b) $\frac{5}{12}$ (c) $5\sqrt{10}$ (d) $\frac{5}{12}\sqrt{10}$
Q.28	If α,β are roots of $ax^2+bx+b=0,$ then $\sqrt{\frac{\alpha}{\beta}}+\sqrt{\frac{\beta}{\alpha}}+\sqrt{\frac{b}{a}}$ is (a) 1 (b) 0 (c) 2 (d) $2\sqrt{\frac{b}{a}}$
Q.29	If r is the ratio of the roots of the equation $ax^2+bx+c=0,$ $then\frac{(r+1)^2}{r}=$ (a) 1 (b) $\frac{b^2}{ac}$ (c) $\frac{ac}{b^2}$ (d) b^2-4ac
Q.30	If $x^2-ax+1=0$ has two real and different roots, then a does not lie between (a) -1 and 1 (b) -2 and 2 (c) 1 and 2 (d) -1 and -2
Q.31	Which of the following quadratic polynomial can be factorized into a product of real linear factors? (a) $2x^2-5x+9$ (b) $2x^2+4x-5$ © $3x^2+4x+6$ (d) $5x^2-3x+2$
Q.32	The value of k for which $3x^2+2x+k=0$ has real roots is : (A) $k>\frac{1}{3}$ (B) $k\leq\frac{1}{3}$ (C) $k\geqslant\frac{1}{3}$ (D) $k<\frac{1}{3}$
Q.33	The only real root (s) of the equation $28x^3-9x^2+2=0$ is (are): (a) $\frac{1}{4}$ (b) $-\frac{1}{4}$ (c) $-\frac{1}{4}and\left(1+3\sqrt{2}\right)$ (d) $1+3\sqrt{2}$
Q.34	Find the minimum value of x^2-2x+7 for real values of x: (a) 8 (b) 4 (c) 6 (d) 2
Q.35	The roots of the equation $2\left(a^2+b^2\right)x^2+2(a+b)x+1=0$ are always:

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	(a) real and equal (b) real and irrational (c) real and rational (d) none
Q.36	If one root of the equation $ax^2+bx+c=0$ is three times the other, then (a) $2b^2=9ac$ (b) $b^2=16ac$ (c) $b^2=ac$ (d) $3b^2=16ac$.
Q.37	The values of k for which the equation $2x^2-kx+x+8=0$ will have real and equal roots are (a) 9 and -7 (b) only 9 (c) only -7 (d) -9 and 7 .
Q.38	The quadratic equation whose roots are twice the roots of $2x^2-5x+2=0$ is (a) $8x^2-10x+2=0$ (b) $x^2-4x+4=0$ (c) $x^2-5x+4=0$ (d) $2x^2-5x+2=0$
Q.39	If a and b are the roots of $x^2-px+q=0$, then $a^2+b^2=$ (a) p^2+q^2 (b) p^2+2q (c) p^2-q^2 (d) p^2-2q .
Q.40	If one roots of the equation $2x^2-3x+p=0$ is 3, then value of p is (a) -8 (b) 8 (c) -9 (d) 9
Q.41	Which of the following equations has the sum of its roots as 3? (a) $x^2+3x-5=0$ (b) $-x^2+3x+3=0$ (c) $\sqrt{2}x^2-\frac{3}{\sqrt{2}}x-1$ (d) $3x^2-3x-3=0$
Q.42	The sum and product of the zeroes of a quadratic equation are $\frac{-1}{2}$ and - 3 respectively. Then what is the quadratic equation (A) $2x^2+x-6=0$ (B) $x^2+x-6=0$ (C) $x^2+x-6=0$ (D) NONE
Q.43	The nature of roots of the quadratic equation : $4x^2-12x-9=0$ (a) Real and equal (b) Real and unequal (c) not real (d) none
Q.44	Which of the following equations has two distinct real roots ? (a) $2x^2-3\sqrt{2}x+\frac{9}{4}=0$ (b) $x^2+4x-3\sqrt{2}=0$ (c) $x^2-4x-3\sqrt{2}=0$ (d) $5x^2-3x+1=0$
Q.45	If one roots of the equation $px^2-14x+8=0$ is six times the other, then p is equal to (a) 2 (b) 3 (c) 1 (d) none of these
Q.46	The value of k for which the equation $x^2+2(k+1)x+k^2=0$ has equal roots is (a) -1 (b) $-\frac{1}{2}$ (c) 1 (d) none of these
Q.47	If one roots of the equation $px^2-14x+8=0$ is six times the other, then p is equal to (a) 2 (b) 3 (c) 1 (d) none of these
Q.48	The sum S of first n even natural numbers is given by the relation s = n(n+1). Value of n, if the sum is 420 (A) 20 (B) 22 (C) 18 (D) NONE
Q.49	Which of the following equations has two distinct real roots ? (a) $2x^2-3\sqrt{2}x+\frac{9}{4}=0$ (b) $x^2+4x-3\sqrt{2}=0$ (c) $x^2-4x-3\sqrt{2}=0$ (d) $5x^2-3x+1=0$
Q.50	If one root of the quadratic equation $5x^2+13x+k=0$ is reciprocal of the other, then the value of k is (a) 0 (b) 5 (c) $\frac{1}{6}$ (d) 6
Q.51	The value of k for which the equation $x^2+2(k+1)x+k^2=0$ has equal roots is (a) -1 (b) $-\frac{1}{2}$ (c) 1 (d) none of these
Q.52	The number which exceeds its positive square root by 12 is **(a) 9 (b) 16 (c) 25 (d) None of these**
Q.53	If the roots of a quadratic equation $ax^2+bx+c=0$ are equal, then (a) $b^2-4ac>0$ (b) $b^2-4ac=0$ (c) $b^2-4ac<0$ (d) $b^2-ac=0$
Q.54	If the sum of the zeros of the quadratic equation $(2k+1)x^2-3(k+2)x+5=0$ is 3 , then k = **(a) 1 (b)** $-\frac{1}{3}$ **(c) - 1 (d) none of these**
Q.55	The value of $\sqrt{6+\sqrt{6+\sqrt{6+.....}}}$ (a) 3 (b) - 2 (c) 3 OR -2 (d) -3 OR 2
Q.56	Which of the following quadratic equation can be factorized into a product of real linear factors? (a) $2x^2-5x+9=0$ (b) $2x^2+4x-5=0$ © $3x^2+4x+6=0$ (d) $5x^2-3x+2=0$
Q.57	If one roots of the equation $px^2-14x+8=0$ is six times the other, then p is equal to (a) 2 (b) 3 (c) 1 (d) none of these
Q.58	If r is the ratio of the roots of the equation $ax^2+bx+c=0, then \frac{(r+1)^2}{r}=$ (a) 1 (b) $\frac{b^2}{ac}$ (c) $\frac{ac}{b^2}$ (d) b^2-4ac
Q.59	If the roots of the equation $12x^2+mx+5=0$ are in the ratio 3:2, then m equals

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	(a) $\frac{1}{12}$ (b) $\frac{5}{12}$ (c) $5\sqrt{10}$ (d) $\frac{5}{12}\sqrt{10}$
Q.60	The raito of the sum and product of the roots of $7x^2-12x+18=0$ is (a) 7 : 12 (b) 2 : 3 (c) 3 : 2 (d) 7 : 18
Q.61	If $x^2-ax+1=0$ has two real and different roots, then a does not lie between (a) -1 and 1 (b) -2 and 2 (c) 1 and 2 (d) -1 and -2
Q.62	The discriminant of the quadratic equation $ax^2-4ax+(2a+1)=0$ (a) 4a (2a + 1) (b) 2a (2a + 1) (c) 4a (2a – 1)(d) 2a (4a – 1)
Q.63	Which of the following equation can not be written in the form of $ax^2+bx+c=0$, (a) $(x+2)^3=x^3-4$ (b) $x(2x+3)=x^2+1$ (c) $x(x+1)+8=(x+2)(x-2)$ (d) $(x-2)^2+1=2x-3$
Q.64	If α , β , are the roots of equation $x^2-8x+p=0$ and $\alpha^2+\beta^2=40$ then p is equal to (a) 8 (b) 10 © 12 (d) 14
Q.65	Which of the following equation has the sum of its roots as -5 ? (a) $x^2+5x+6=0$ (b) $x^2-5x+6=0$ (c) $x^2-5x-6=0$ (d) $x^2-5x-8=0$
Q.66	If α , β are the zeros of the quadratic equation $x^2+x+1=0$, *then* $\frac{1}{\alpha}+\frac{1}{\beta}=$ (a) 1 (b) -1 (c) 0 (d) None of these
Q.67	If one zero of the quadratic equation $(k^2+4)x^2+13x+4k=0$ is reciprocal of the other, then k = (a) 2 (b) -2 (c) 1 (d) -1
Q.68	If the sum of the zeros of the quadratic equation $(2k+1)x^2-3(k+2)x+5=0$ is 3 , then k = (a) 1 (b) $-\frac{1}{3}$ (c) - 1 (d) none of these
Q.69	If α , β are the zeros of the quadratic equation $x^2-3x+2=0$ then $\frac{\sqrt{\alpha}}{\sqrt{\beta}}-\frac{\sqrt{\beta}}{\sqrt{\alpha}}=$ (a) 1 (b) 2 (c) $\sqrt{2}$ (d) $\frac{1}{\sqrt{2}}$
Q.70	If α , β are the zeros of the quadratic equation $ax^2+bx+c,=0$ then $\frac{1}{\alpha^2}+\frac{1}{\beta^2}=$

	(a) $\frac{b^2-2ac}{a^2}$ (b) $\frac{b^2-2ac}{c^2}$ (c) $\frac{b^2+2ac}{a^2}$ (d) $\frac{b^2+2ac}{c^2}$
Q.71	If the sum of the zeros of the quadratic equation $(k^2-14)x^2-2x-1=0$ is 1, then one of the value of k is (a) $\sqrt{14}$ (b) -14 (c) 2 (d) - 4
Q.72	If one of the zeroes of the quadratic equation $(k-1)x^2+kx+1=0$ is -3 then the value of k is (a) $-4/3$ (b) 4/3 (c) 2/3 (d) -2/3 .
Q.73	The quadratic equation with -81 and 3 as product and one of the zeroes respectively is : (a) $x^2+24x-81=0$ (b) $x^2-24x-81=0$ (c) $x^2-24x+81=0$ (d) $x^2+24x+81=0$
Q.74	The zeroes of the quadratic equation $x^2+99x-100=0$ are : (a) both positive (b) both negative © one positive and one negative (d) both equal
Q.75	If α,β are zeroes of $x^2-4x+1=0$ then $\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$ is : (a) 3 (b) 5 (c) -5 (d) -3
Q.76	Which of the following is a root of the equation $2x^2-5x-3=0$? (A) $x=3$ (B) $x=4$ (C) $x=1$ (D) $x=-3$
Q.77	For what value of k, the equation $kx^2-6x-2=0$ has equal roots ? (A) $\frac{7}{2}$ (B) $\frac{-9}{2}$ (C) -3 (D) $\frac{-7}{2}$
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