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Class: X
Subject: Maths
Topic: Quadratic Equations
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Q1. The equation $x - \frac{7}{x-3} = 3 - \frac{7}{x-3}$ has_____.

A. One integral root
B. No root
C. Two real roots
D. Infinitely many roots

Solutions: B

Common mistake student cancels 7/x-3 from both side and write x=3
But x cannot be 3 as at that value 7/x-3 will not be defined. So no root.

Q2. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots, is _____.

A. None of these
B. 8
C. 12
D. 16

Solutions: D

Apply D>=0 for both equations and find values which satisfies both conditions.

Q3. If the quadratic equation kx (x - 2) + 6 = 0 has equal roots, then the value of 'k' is

A. 5
B. 6
C. 4
D. 3

Solutions: B

D= 4k^2-24k =0
k=6

Q4. The root/roots of $\sqrt{2x - 3} + \sqrt{3x - 5} - \sqrt{5x - 6} = 0$ is/are _____.

A. 2
B. 7/6
C. 2 or 7/6
D. ±1/3

Solutions: A

Best method is to substitute and check which of them satisfies Otherwise take one term on RHS and square both sides. Simplify and get rational terms on 1 side and irrational on other. Again square both sides. and solve for x.

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Q5. If x = 1 is a common root of the equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then ab is equal to _____.

A. 3
B. 3.5
C. 6
D. -3

Solutions: A

Put 1 in both equations
from 1st equation a= -3/2
from 2nd equation b= -2
ab=3

Q6. The graph of the equation $y = ax^2 + bx + c$ has shape open upwards like 'È' which is known as parabola, when _____.

A. a < 0
B. a > 0
C. a = 0
D. $a \neq 0$

Solutions: B

Coefficient of x^2 >0 for upward parabola

Q7. The roots of $(x^2 - 3x + 2)(x)(x - 4) = 0$ are _____.

A. 4
B. 0 and 4
C. 0, 1, 2 and 4
D. 1, 2 and 4

Solutions: C

Factorize first polynomial as (x-2) (x-1)
So roots will be 2,1,0,4

Q8. The equation $\sqrt{x+4} - \sqrt{x-3} + 1 = 0$ has_____.

A. No real root
B. One real root
C. One real and one imaginary root
D. Two imaginary roots

Solutions: A

Either do it by hit and trial if you are good in calculations otherwise or follow the squaring method.
By observation in this case root(x+4) >root(x-3)
So root(x+4) +1 > root(x-3)
root(x+4) -root(x-3) + 1 >0
So no real solution

Q9. If the equation $(a^2 + b^2)x^2 - 2(ac + bd)x + c^2 + d^2 = 0$ has equal roots, then _____.

A. ab = cd
B. ad = bc
C. ad=$\frac{2c}{\sqrt{bc}}$
D. ab = cd

Solutions: B

Find discriminant and put it=0

Q10. The roots of $ax^2 + bx + c = 0$, $a \neq 0$ are real and unequal, if $b^2 - 4ac$ is _____.

A. = 0
B. > 0
C. <0
D. ≥ 0

Solutions: B

Fact

Q11. A man walks a distance of 48 km in a given time. If he walks 2 km/hr faster, he will perform the journey 4 hrs before. His normal rate of walking, is _____.

A. 3 km/hr
B. 4 km/hr
C. - 6 km/hr or 4 km/hr
D. 5 km/hr

Solutions: B

Let x be speed and y be time taken
xy=48
(x+2) (y-4) = 48 = xy
xy +2y -4x -8 = xy
2y-4x -8 = 0
Again x = 48/y
Subsitute and solve the quadratic equation.

Q12. A convex polygon has 44 diagonals. The number of its sides is _____.

A. 10
B. 11
C. 12
D. 13

Solutions: B

Let n be number of sides of polygon.
(n-3) + (n-4) + (n-5) + … +n-(n-1) =44
n(n-3) -(3+4+5+6+ n-1) = 44 (there n-3 terms)
Simplify both to get n

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Q13. If $\frac{b}{x-a} = \frac{x+a}{b}$, then the value of x in terms of a and b is_____.

A. $\pm\sqrt{a^2+b^2}$
B. $3+\sqrt{a^2+b^2}$
C. $3-\sqrt{a^2+b^2}$
D. $\pm\sqrt{a^2-b^2}$

Solutions: A

$b^2 = (x+a)(x-a)$
$b^2 = x^2 - a^2$
$x^2 = a^2 + b^2$

Q14. The discriminant of the quadratic equation $3\sqrt{3}x2+10x+\sqrt{3}=0$ is

A. 64
B. 60
C. 62
D. 72

Solutions: A

D= 102- 4(3√3√3) = 10036=
64

Q15. The nature of the roots of the equation $\sqrt{3}\ x2 - 2\sqrt{2}\ x - 2\sqrt{3} = 0$ i s

A.none of these
B. not real
C. real and equal
D. real and unequal

Solutions: D

D= $(-2\sqrt{2})24(\sqrt{}$
$3)(-2\sqrt{3}) = 32 > 0$

Q16. If one root of the equation a (b - c) x2 + b (c - a) x + c (a - b) = 0 is 1, then the other root is _____.

A. b (c - a) a (b - c)
B. c (a - b) a (b - c)
C. b (c - a) a (b - c)
D. a (b - c) c (a - b)

Solutions: D

Use the relation between coefficients and roots
Product of roots= constant term/coefficient of x^2

Q17. In the equation $\frac{x(x-1)-(m+1)}{(x-1)(m-1)}=\frac{x}{m}$, the roots are equal when _____.

A. m= ½
B. m= -1/2
C. m = 0
D. m = 1

Solutions: B

Cross Multiply and Simply and get D and equate it to 0

Q18. If $\sqrt{x-1}-\sqrt{x+1}+1=0$, then 4x is equal to _____.

A. $4\sqrt{-1}$
B. 5/4
C. 5
D. $1\frac{1}{4}$

Solutions: C

Take root(x+1) on other side and square both sides and simply to get x=5/4.

Q19. The roots of $ax^2+bx+c=0,\ a\neq 0$ are real, if b^2-4ac is _____.

A. = 0
B. ≥0
C. ≤0
D. > 0

Solutions: B

Fact

Q20. The value of k, if the expression $x^2 + kx + 1$ is factorisable into two linear factors, is _____.

A. k ≤2
B. k ≥-2
C. Either k ≥2 or k ≤ -2
D. - 2 ≤ k ≤ 2

Solutions: C

Two linear factor means roots are real and distant
$k^2-4 > 0$
$k^2 > 4$
k>2 or k<-2