MATHEMATICS WORKSHEET
QUADRATIC EQUATIONS

VERY SHORT ANSWER TYPE QUESTIONS

Q1. Show that x=-3 is the solution of equation $x^2+6x+9=0$.

Q2. For what value of k are the roots of quadratic equation $3x^2+2kx+27=0$ real and equal .

Q3. Find the discriminant of the quadratic equation

$3\sqrt{3}\,x+10\,x+\sqrt{3}=0$

Q4. Write the nature of roots of quadratic equation

$4x^2+4\sqrt{3}\,x+3=0$

Q5. Which of the following are quadratic equations-

a) $x^3-x=x^2+2$

b) $\sqrt{x+4}=(x+1)$

c) $(x+1)(x^2-2)=(x+3)^3$

SHORT ANSWER TYPE QUESTIONS-I

Q6. Solve for x:

a) $x^2-2(a^2+b^2)x+(a^2-b^2)^2=0$

b) $4/x-3 = 5/2x+3$, $x = 0, -3/2$

c) $\sqrt{2}x^2+7x+5\sqrt{2}=0$

d) $(a+b)^2x^2+8(a^2-b^2)x+16(a-b)^2=0$

e) $\frac{1}{a+b+x} = \frac{1}{a}+\frac{1}{b}+\frac{1}{x}$, $a\neq 0, b\neq 0, x\neq 0$

Q7. If one root of equation $3x^2-kx-2=0$ is 2, find the value of k.Also find the other root.

Q8. If -5 is a root of the quadratic equation $2x^2+px-15=0$ and the quadratic equation $p(x^2+x)+k=0$ has equal roots, find the value of k.

Q9. Find the value of k for which the roots of quadratic equation are equal

$(k-4)x^2+2(k-4)x+2=0$

Q10. Find the value of p so that the quadratic equation

$px(x-3)+9=0$ has two equal roots.

Q11. Find the value of k for which the equation $x^2+kx+64=0$ and $x^2-8x+k=0$ will both have Real roots.

Q12. In the following determine the set of values of p for which the given equation has real roots-

a) $2x^2+px+3=0$

b) $px^2+4x+1=0$

SHORT ANSWER TYPE QUESTIONS-II

Q13. If the roots of the equation
$(b-c)x^2+(c-a)x+(a-b)=0$ are equal then prove that $2b=a+c$.

Q14. Find the values of a and b if the sum and product of roots of the equation
$4ax^2+4bx+3=0$ are 1/2 and 3/16 .

Q15. If the roots of the equation
$(c^2-ab)x^2-2(a^2-bc)x+b^2-ac=0$
Are equal prove that either $a=0$ or $a^3+b^3+c^3=3abc$

Q16. If the roots of the equation
$(1+m^2)x+2mcx+(c^2-a^2)=0$
Prove that $c^2=a^2(1+m^2)$

Q17. Solve for x:

a) $\frac{2}{x+1}+\frac{3}{2(x-2)}=\frac{23}{5x}$, $x\neq 0, -1, 2$

b) $\frac{x+1}{x-1}+\frac{x-2}{x+2}=3$, $x\neq 1, -2$

LONG ANSWER TYPE QUESTIONS

Q18. A speed of a boat in still water is 11km/hr. It can go 12 km upstream and return downstream to the original point in 2 hours 45 minutes ,find the speed of the stream.

Q19. A fast train takes 3 hours less than a slow train for a journey of 600 km .If the speed of slow train is 10 km/hr less than that of the fast train ,find the speed of two trains.

Q20. Seven years ago Varun's age was five times the square of Swati's age .Three years hence Swati's age will be two fifth of varun's age.Find their present ages.

Q21. By increasing the list price of a book by ₹510 a person can buy 10 less books for ₹1200 , find the original list price of book.

Q22. The numerator of a fraction is one less than it's denominator .If three is added to each Numerator and denominator the fraction is increased by 3/28.Find the fraction.

Q23. A two digit number is 5 times the sum of it's digits and is also equal to 5 more than twice the the product of it's digits ,find the number.

Q24. Aeroplane left 30 minutes later than it's scheduled time and in order to reach destination 1500 km away in time ,it has to increase it's speed by 250 km/hr from it's usual speed ,determine it's usual speed.

Q25. A man sells a table for ₹96 and gains as much percent as the cost of table .Find the cost price of table.

Q26. There are three consecutive integers such that square of the first increased by the product of the other two gives 154 .What are the integers.

Q27. A piece of cloth costs ₹200 . If the piece were 5m longer and each metre of cloth costed ₹2 less the cost of the piece would have remained unchanged .How long is the piece and what is it's original rate per metre.

Q28. Out of a group of swans,7/2 times the square root of the total number are playing on the shore of pond ,the two remaining ones are swimming in water .Find the total

number of swans.

Q29. Two pipes running together can fill a cistern in 6 minutes .If one pipe takes 5 minutes more than the other to fill the cistern , find the time in which each pipe would fill the cistern.

Q30. A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together can finish the work in 4 days , find the time taken by B to finish the work.

Q31. Solve for x:

a) $\frac{3x-4}{7} + \frac{7}{3x-4} = \frac{5}{2}$, $x \neq \frac{4}{3}$

b) $2\left(\frac{2x-1}{x+3}\right) - 3\left(\frac{x+3}{2x-1}\right) = 5$, $x \neq -3$, $x \neq \frac{1}{2}$

Answers:

2)$k=\pm 9$ (3)64 (4)Real and equal roots (5) c (6) (a) $(a+b)^2$,$(a-b)^2$ (b)-2,1 (c)$-5\sqrt{2}$,$-\sqrt{2}$ (d)-4(a-b)/a+b (e) -a ,-b (7) 5, $-\frac{1}{3}$ (8)7/4 (9)6 (10)p=4 (11)k=16 (12)(a)$p \geq 2\sqrt{6}$ or $p \leq -2\sqrt{6}$ (b)$p \leq 4$ (17)(a)24 (b)-5,2 (18)5 km/hr (19)40,50 (20)9,27 (21)30 (22) 3/4 (23) 45 (24) 750 (25)60 (26)8,9,10 (27) 20m, 10 (28) 16 (29)10 and 15 minutes (30) 12 days (31) (a)6,5/2 (b)-10,$-\frac{1}{5}$