# DAV PUBLIC SCHOOL, IFFCO, PARADEEP

**CLASS-X**
**SUB-MATHEMATICS**
**TOPIC-QUADRATIC EQUATION**
**HOTS QUESTIONS**

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

2. If the ratio of the roots of the equation $lx^2+nx+n=0$ *is p:q.* prove that

$$\sqrt{\frac{p}{q}}+\sqrt{\frac{q}{p}}+\sqrt{\frac{n}{l}}=0$$

3. Find the value of $x \ if \ \sqrt{6+\sqrt{6+\sqrt{6+\cdots}}}=x$ .

4. Solve for x:

   a) $9x^2-9(a+b)x+(2a^2+5ab+2b^2)=0$

   b) $\frac{1}{2a+b+2x}=\frac{1}{2a}+\frac{1}{b}+\frac{1}{2x}$  ans: x= -a, -b/2

   c) $\frac{2x}{x-3}+\frac{1}{2x+3}+\frac{3x+9}{(x-3)(2x+3)}=0$

   d) $x=\cfrac{1}{2-\cfrac{1}{2-\cfrac{1}{2-x}}}$

   e) $\left(\frac{4x-3}{2x+1}\right)-10\left(\frac{2x+1}{4x-3}\right)=3$

   f) $6\sqrt{\frac{x}{x+4}}-2\sqrt{\frac{x+4}{x}}=1$

5. Two years ago the man's age was three times the square of his son's age. Three years hence his age will be four times his son's age. Find their present ages.

6.  A train travelling at a uniform speed for 360 km would have taken 48 minutes less to travel the same distance if its speed were 5 km/hour more. Find the original speed of the train.

7.  One fourth of a group of student claim they are creative, twice of the square root of the group claims to be deciplined and the remaining 15 claims they are punctual. Find the number of student in the group.

8.  Three consecutive positive integers are such that the sum of the square of first and product of rest two integers is 46, find the integers.

9.  The difference of squares of two numbers is 88. If the larger number is 5 less than twice the smaller number, then find two numbers.

10. Two taps running together can fill a tank in $3\frac{1}{13}$ hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank.

11. Had Smita scored 10 more marks in her mathematics test out of 30 marks, 9 times these marks would have been the square of her actual marks. How many marks did she get in the test?

12. At $t$ minutes past 2 pm, the time needed by the minutes hand of a clock to show 3 pm was found to be 3 minutes less than $t^2/4$ minutes. Find $t$.

13. A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original speed?

14. The denominator of a fraction is two more than its numerator. If the sum of the fraction and its reciprocal is $\frac{34}{15}$, find the fraction.