

## Class-X CH-4 Quadratic Equations

### Maths Assignment

1. Solve for x

(i)  $4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$

Ans  $\left( x = -\frac{2}{3} \text{ or } x = \frac{\sqrt{3}}{4} \right)$

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

Ans  $\left( x = \frac{-5}{\sqrt{2}} \text{ or } x = -\sqrt{2} \right)$

(iii)  $x^2 - (\sqrt{2} + 1)x + \sqrt{2} = 0$

Ans  $(x = \sqrt{2} \text{ or } x = 1)$

2. For what value of K

$(4-k)x^2 + (2x+4)x + (8k+1) = 0$  is a perfect square.

Ans  $(k=0,3)$

3. Solve for x:

$2\left(\frac{x+2}{2x-3}\right) - 9\left(\frac{2x-3}{x+2}\right) = 3$  given that  $x \neq -2$   $x \neq \frac{3}{2}$  Ans  $\left( x = \frac{5}{8}, \frac{11}{5} \right)$

4. Find the value of p which will make the product of  $2p-5$  and  $p-4$  equal value to  $p+8$ .

Ans  $(p=1,6)$

5. If  $\sin \alpha$  and  $\cos \alpha$  are roots of equation  $ax^2+bx+c=0$  then prove that  $a^2+2ac=b^2$ .

6. Solve for x :  $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

Ans  $(a \neq 0, b \neq 0, x \neq 0)$

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

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

8. A natural number, when increased by 12, equals 160 times its reciprocal. Find the number.

Ans The natural number is 8

9. Determine the values of p for which the quadratic equation  $2x^2+px+8=0$  has real roots.

Ans  $(\{ p \in \mathbb{R} : p \geq 8 \text{ or } p \leq -8 \})$

10. If the equation  $(1+m^2)x^2 + 2mcx + (c^2-a^2)=0$  has equal roots, prove that  $c^2 = a^2(1+m^2)$ .

11. Find the values of  $k$  for which the roots of the equation  $(k+4)x^2 + (k+1)x + 1 = 0$  are real and equal. Ans( $k = 5$  or  $k = -3$ )
12. An aeroplane left 30 min later than its scheduled time and in order to reach the destinations 1500 km away in time it has to increase its speed by 250 km/h from its usual speed. Determine its usual speed.  
Ans(750 km/h)
13. A peacock is sitting on the top of a pillar which is 9m high. From a point 27m away from the bottom of the pillar, a snake is coming to its hole at the base of pillar. Seeing the snake the peacock pounces on it. If their speeds are equal at what distance from the hole is the snake caught?  
Ans(12 m)
14. The time taken by a person to cover 150 km was  $2\frac{1}{2}$  hours more than to time taken in return journey. If he returned at a speed of 10 km/h more than speed of going. What was the speed per hour in each direction?  
Ans (20km/h, 30km/h)
15. A tourist has Rs 10,000 with him. He calculated that he could spend Rs  $x$  everyday on his holidays. He spent Rs( $x-50$ ) everyday and extended his holidays by 10 days.  
(i) Calculate  $x$   
(ii) What value is depicted by tourist. Ans(250)
16. At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.  
Ans (Nisha's age is 5 years and Asha's age is 27 years)
17. 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  $\frac{t^2}{4}$  minutes. Find  $t$ .  
Ans(14)

## Class-X CH-5 Arithmetic Progression (Maths Assignment)2018

1. Write the first three terms of the A.P's when a and d are given.

$$a = \sqrt{2}, d = \frac{1}{\sqrt{2}}$$

$$\text{Ans} \left( \sqrt{2}, \frac{3}{\sqrt{2}}, 2\sqrt{2} \right)$$

2. Solve the equation  $-4 + (-1) + 2 + \dots + x = 437$

$$\text{Ans}(x=50)$$

3. Find the 12<sup>th</sup> term from the end of the AP.

$$-2, -4, -6, \dots, -100$$

$$\text{Ans}(-78)$$

4. Is 0 is a term of AP : 31, 28, 25, ..... Justify your answer.

$$\text{Ans(No)}$$

5. Find the values a, b and c such that the numbers 9, 7, b, 23 and c are in AP.

$$\text{Ans}(a=-1, b=15, c=31)$$

6. Find x so that  $2x+1$ ,  $x^2+x+1$  and  $3x^2-3x+3$  are consecutive terms of an AP.

$$\text{Ans}(x=2 \text{ or } x=1)$$

7. Which term of the sequence

$$17, 16\frac{1}{5}, 15\frac{2}{5}, 14\frac{3}{5}, \dots \text{ is the first negative term?}$$

$$\text{Ans}(23^{\text{rd}} \text{ term})$$

8. The sum of first six terms of an AP is 42. The ratio of its 10<sup>th</sup> term to its 30<sup>th</sup> term is 1:3 calculate the first and thirteenth term of the AP.

$$\text{Ans}(a_1=2, a_{13}=26)$$

9. If m times the m<sup>th</sup> term of an AP is equal to n times its n<sup>th</sup> term find (m+n) th term of AP.

$$\text{Ans}(0)$$

10. Show that the sum of first n even natural numbers is equal to  $\left(1 + \frac{1}{n}\right)$  times the sum of first n odd natural nos.

11. Value Based Question :- Saurav gets pocket money from his father every day. Out of the pocket money he saves Rs 2.75 on the first day and on each succeeding day he increases his saving by 25 paise. Find

(i) the amount saved by Sourav the 14<sup>th</sup> day

(ii) the amount saved by Sourav the 25<sup>th</sup> day

(iii) the total amount saved by Sourav in 30 days.

$$\text{Ans}(\text{Rs } 6, \text{Rs } 8.75, \text{Rs } 191.25)$$

12. Find the sum

$$\frac{a-b}{a+b} + \frac{3a-2b}{a+b} + \frac{5a-3b}{a+b} + \dots \text{ to 11 terms}$$

$$\text{Ans} \left( S_{11} = \frac{11}{2} \left[ \frac{22a-12b}{a+b} \right] \right)$$

13. In an AP if  $S_n = 3n^2 + 5n$  and  $a_k = 164$  find the value of k.

$$\text{Ans}(k=27)$$

14. In an AP prove that

$$P_{m+n} + P_{m-n} = 2P_n \text{ where } P_m \text{ denotes its } m^{\text{th}} \text{ term.}$$

15. Which term of the AP 3, 8, 13, 18, .... will be 55 more than its 20<sup>th</sup> term. Ans(31<sup>st</sup>)

16. If  $S_n$ , the sum of first  $n$  terms of an AP is given by  $S_n=(3n^2+4n)$ , then find its  $n$ th term.  
Ans  $T_n=(6n-7)$
17. A sum of ₹ 2800 is to be used to award four prizes. If each prize after the first is ₹ 200 less than the preceding prize, find the value of each of the prizes.  
Ans (₹ 1000, ₹800, ₹600, ₹400)
18. How many numbers lie between 10 and 300, which when divided by 4 leave a remainder 3 ?      Ans (73)
19. The eighth term of an AP is half its second term and the eleventh term exceeds one third of its fourth term by 1. Find the 15<sup>th</sup> term.      Ans(3)
20. An AP consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three is 429. Find the AP.      Ans(3,7,11,15,.....)

## Assignment

## Ch 8. Trigonometry. class X<sup>th</sup>

Q1) In  $\triangle ABC$ ,  $\angle B = 90^\circ$ ,  $AB = 3$  cm,  $BC = 4$  cm find  
(i)  $\sin C$  (ii)  $\cos C$  (iii)  $\sec A$  (iv)  $\operatorname{cosec} A$ .

Q2) In rt.  $\triangle ABC$ , rt. angled at  $B$ , the ratio of  $AB$  to  $AC$  is  $1 : \sqrt{2}$ . Find the value of  $\frac{2 \tan A}{1 + \tan^2 A}$ .

Q3) Evaluate:  $(\sec^2 37^\circ - \cot^2 53^\circ) \tan 21^\circ \tan 69^\circ$   
 $- \sin 51^\circ \cos 39^\circ - \cos 51^\circ \sin 39^\circ$

Q4) Prove that  $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta$

Q5) If  $\sec \theta = x + \frac{1}{4x}$  then prove that  
 $\sec \theta + \tan \theta = 2x$  or  $\frac{1}{2x}$ .

Q6) If  $\tan(2\theta - 3\alpha) = \cot(5\alpha - 2\theta)$  find value of  $\alpha$ .  
hence evaluate:  $\sin \alpha \sec \alpha \tan \alpha - \operatorname{cosec} \alpha \cos \alpha \cot \alpha$ .

Q7) If  $p = \sec A + \tan A$  then prove that  
 $\sin A = \frac{p^2 - 1}{p^2 + 1}$

Q8) Simplify  $\frac{\sin^3 \theta + \cos^3 \theta}{\sin \theta + \cos \theta} + \sin \theta \cos \theta$

Q9)  $(\sec \theta - \tan \theta)^2 = \frac{1 - \sin \theta}{1 + \sin \theta}$

Q10) Prove that  $\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A} = 2 \operatorname{cosec} A$ .

Q11) Prove that  $\frac{\cos A - \sin A + 1}{\cos A + \sin A + 1} = \sec A + \tan A$ .

Q12) If  $a \operatorname{cosec} A = p$  and  $b \cot A = q$  then  
prove that  $\frac{p^2}{a^2} + \frac{q^2}{b^2} = 1$

Q13. If  $\sec A - \tan A = x$  show that

$$\frac{x^2 + 1}{x^2 - 1} = \csc A.$$

Q14. If  $\sec 3\beta = \csc(\beta - 22^\circ)$  and  $3\beta$  is an acute angle find the value of  $\beta$ .

Q15. Evaluate:  $\tan 35^\circ \tan 40^\circ \tan 45^\circ \tan 50^\circ \tan 55^\circ$

Ans 1.  $\frac{3}{5}, \frac{4}{5}, \frac{5}{3}, \frac{5}{4}$

Ans 2. 1

Ans 3. 0

Ans 4. —

Ans 5. —

Ans 6.  $\alpha = 45^\circ, 0$

Ans 7. —

Ans 8. 1

Ans 9. —

Ans 10. —

Ans 11. —

Ans 12. —

Ans 13. —

Ans 14.  $28^\circ$

Ans 15. 1

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