MATHEMATICS

VALUE BASED QUESTIONS

QUESTION BANK FOR SA-I

for

CLASS – X

2016 – 17

CHAPTER WISE COVERGAE OF EXPECTED VALUE BASED QUESTIONS

Prepared by

M. S. KUMARSWAMY, TGT(MATHS)
M. Sc. Gold Medallist (Elect.), B. Ed.

Kendriya Vidyalaya GaCHiBOWli

PREFACE

It gives me great pleasure in presenting the Question Bank for Value Based Questions for Class X Mathematics for SA-I Examination. It is in strictly according to the latest guidelines issued by CBSE CCE.

The CBSE has introduced the concept of value based questions in question papers of all main subject from the session 2012-13. Total 3-5 marks questions will be value based from this year onward in CBSE question papers. These questions are based on values & key messages brought out on the basis of prescribed text. Students have the liberty to go beyond the set text.

I avail this opportunity to convey my sincere thanks to respected sir, Shri U. N. Khaware, Additional Commissioner(Acad), KVS Headquarter, New Delhi, respected sir, Shri S. Vijay Kumar, Joint Commissioner(Admn), KVS Headquarter, New Delhi, respected sir Shri P. V. Sairanga Rao, Deputy Commissioner(Acad), KVS Headquarter, New Delhi, respected sir Shri. D. Manivannan, Deputy Commissioner, KVS RO Hyderabad, respected sir Shri Isampal, Deputy Commissioner, KVS RO Bhopal, respected sir Shri Jagdish Mohan Rawat, Director, KVS ZIET Chandigarh, respected sir Shri P. Deva Kumar, Deputy Commissioner, KVS RO Bangalore, respected sir Shri Nagendra Goyal, Deputy Commissioner, KVS RO Ranchi, respected sir Shri Y. Arun Kumar, Deputy Commissioner, KVS RO Agra, respected sir Shri Sirimala Sambanna, Assistant Commissioner, KVS RO Hyderabad, respected sir Shri. K. L. Nagaraju, Retd-AC, KVS RO Bangalore and respected sir Shri M.K. Kulshreshtha, Retd-AC, KVS RO Chandigarh for their blessings, motivation and encouragement in bringing out this project in such an excellent form.

I also extend my special thanks to respected sir Shri. P. S. Raju, Principal, KV Gachibowli, respected madam Smt. Nirmala Kumari M., Principal, KV Mysore & respected sir Shri. M. Vishwanatham, Principal, KV Raichur for their kind suggestions and motivation while preparing this Question Bank. I would like to place on record my thanks to respected sir Shri. P. K. Chandran, Principal, presently working in KV Bambolim. I have started my career in KVS under his guidance, suggestions and motivation.

Inspite of my best efforts to make this notes error free, some errors might have gone unnoticed. I shall be grateful to the students and teacher if the same are brought to my notice. You may send your valuable suggestions, feedback or queries through email to kumarsir34@gmail.com that would be verified by me and the corrections would be incorporated in the next year Question Bank.

M. S. KUMARSWAMY

DEDICATED

TO

MY FATHER

LATE SHRI. M. S. MALLAYYA

CHAPTER - 1
REAL NUMBERS

1. 96 defective pens are accidentally mixed with 105 good pens (a) What is LCM of 96 and 105? (b) the shopkeeper draws a pen and finds it to be defective. The shopkeeper did not sell and kept the pen aside. Which value is shown by the shopkeeper?

2. 50 people work in a cooperative society. They all use their own conveyance. 20 people use their scooter, 12 go by their cars, 16 go by public transport and 2 use bicycles. (a) Find the HCF of 20, 12, 16 and 2 (b) One day they all decided to go by public transport which value is shown by them?

3. Manoj and Ajay planned to participate in a cycle race to be organized for national integration. They decided to practice on a circular path around a sports field. Manoj takes 18 minutes, to complete one round, while Ajay takes 12 minutes for the same. Suppose they both start at the same time and go in the same direction. (a) After how much minutes will they meet again at the starting point. (b) What is the value depicted by Manoj and Ajay?

4. Aakash, Kushal and Harish go for a morning walk. They step off together and their stpes measure 40cm, 42cm and 45cm, respectively. (a) What is the minimum distance each should walk so that each can cover the same distance in complete steps? (b) How is morning walk useful?

5. A sweetseller has 420 *kaju barfis* and 130 *badam barfis*. She wants to stack them for a customer in such a way that each stack has the same number, and they take up the least area of the sweet box. What is the maximum number of *barfis* that can be placed in each stack for this purpose? Which value is shown by the sweetseller?

6. There is a circular path around a sports field. Sonia takes 18 minutes to run one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point? How is running is useful for good health?

7. In a morning walk, three persons step off together. Their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that all can cover the same distance in complete steps? How is morning walk useful for good health?

8. In a seminar, the number, the number of participants in Hindi, English and Mathematics are 60, 84 and 108, respectively. Find the minimum number of rooms required if in each room the same number of participants are to

be seated and all of them being in the same subject. What are the benefits of delivering seminar?

9. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and is to contain cartons of the same drink, what would be the greatest number of cartons each stack would have? What are the harmful affects of using cold drinks?

10. A merchant has 120 litres of oil of one kind, 180 litres of another kind and 240 litres of third kind. He wants to sell the oil by filling the three kinds of oil in tins of equal capacity. What would be the greatest capacity of such a tin? Which value is shown by the merchant?

11. In a school there are two sections – section A and section B of class X. There are 32 students in section A and 36 students in section B. Determine the minimum number of books required for their class library so that they can be distributed equally among students of section A or section B. What are the advantages of library for school?

12. Three sets of English, Hindi and Mathematics books have to be stacked in such a way that all the books are stored topic wise and the height of each stack is the same. The number of English books is 96, the number of Hindi books is 240 and the number of Mathematics books is 336. Assuming that the books are of the same thickness, determine the number of stacks of English, Hindi and Mathematics books. How reading books help a student?

13. A quality control inspector in an egg factory checks every 36th egg for cracks and every 42nd egg for weight. What is the number of the first egg each day that the inspector checks for both qualities? What you will do if you are the inspector and why?

14. The manager at Frank's Snack Shack buys hot dogs in packages of 30. He buys hot dog buns in packages of 24. Unfortunately, he cannot buy part of a package. What is the least number of packages of each product he can buy to have an equal number of hot dogs and hot dog buns? What are the harmful affects of eating junk foods?

15. *A* math teacher and a science teacher combine their first period classes for a group activity. The math class has 24 students and the science class has 16 students. The students need to divide themselves into groups of the same size. Each group must have the same number of math students. Find the greatest number of groups possible. What are advantages of group activities in the class?

16. A photography club is practicing developing techniques in the school. One set of negatives contains 32 negatives and another contains 28 negatives. Each set can be divided equally among the members present.

List all the possible numbers of members present. What is the greatest possible number? What are advantages of the various clubs in the school?

17. Organizers for a middle school culmination have set up chairs in two sections. They put 126 chairs for graduates in the front section and 588 chairs for guests in the back section. If all rows have the same number of chairs, what is the greatest number of chairs possible? What are benefits of participating in programs in the school?

18. A, B and C are good friends. They start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting at the same point. They want to meet again. After what time will they again at the starting point? Which value is depicted from this?

19. Six bells commence tolling together and toll at intervals of 2, 4, 6, 8 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together? What are the importance of punctuality?

20. An electronic device makes a beep after every 60 sec. Another device makes a beep after every 62 sec. They beeped together at 10 a.m. Find the time when they will next make a beep together at the earliest. What is the importance of time?

21. The traffic lights at three different road crossings change after every 48 sec, 72 sec and 108 sec respectively. If they all change simultaneously at 8 : 20 : 00 hours, then at what time they will again change simultaneously. Why traffic lights/signals required at road crossings?

22. Amar, Akbar, Anthony are good friends. They start running to save their mother from Robert at the same time in same direction around a circular lake. Amar completes the whole round in 27 seconds, Akbar in 23 seconds and Anthony in 50 seconds, all starting at the same point. After what time will they meet again at starting point? Which value is depicted from this?

23. A, B, C start at the same time in same direction to run around a circular lake to do morning exercise. A completes the whole round in 12 seconds, B in 23 seconds and C in 45 seconds, all starting at the same point. After what time will they meet again at starting point? What are benefits of doing morning exercise?

24. If the number of apples is 81 and the number of oranges is 237, then find the number of fruits that can be placed in each stack for decoration. Express it as a linear combination of 81 and 237. What are the benefits of fruits?

25. The number of participants for Maths seminar is 65 and that of Science seminar is 117, find the HCF of 65 and 117 and express it in the form 65m + 117n.What are the benefits of delivering seminar?

26. If the number of students taken Maths club is 210 and that of Science club is 55, find the HCF of 210 and 55 such that it is expressible in the form of 210x5 + 55y, find y. What are the benefits of club activities?

27. Ram helped 56 poor children and Shyam helped 72poor children, find the HCF of 56 and 72. Find x, y satisfying HCF = 56x + 72y. Also show that x and y are not unique. Which values depicted from this?

28. Manoj donated Rs. 468 and Ajay donated Rs. 222 to Cancer Aided Society. Find the HCF of 468 and 222 and express it as 468x + 222y where x, y are integers. Which values depicted from this?

29. Shruti donated Rs. 210 and Ayantika donated Rs. 55 to Help Age India. Find the HCF of 210 and 55 and express as 210x + 55y where x, y are integers. Which values depicted from this?

30. A millionaire helped 408 students for submitting their fees and helped 1032 people to get job in reputed institution. Find the HCF of 408 and 1032 and hence express it in the form of 1032m – 408x5, find m. Which values are depicted from this?

31. Murthy reads 657 number of books in one year and Nagesh reads 963 number of books in one year. Find the HCF of 657 and 963 and express it in the form of 657n + 963x(-15), hence find n. What are the benefits of reading habits in student life?

32. Ajay donates Rs. 6, Rs. 8 and Rs. 12 to Help Age India in three consecutive years. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.Which values depicted from this?

33. In English debate competition, the number of students from Class X, XI and XII are respectively 8, 10 and 12. Determine the greatest 3-digit number exactly divisible by 8, 10 and 12. What are the advantages of participating in competitions in school?

34. Ram helped 9828 needy people and Shyam helped 14742 needy people in one year, using Euclid's Division Algorithm find the HCF of 9828 and 14742.Which values depicted from this?

35. If the number of participants in Social Science Exhibition from various Schools are 480 and 672 in 2012 and 2013 respectively in India such that LCM (480, 672) = 3360, find HCF (480,672).What are the advantages of participating in Social Science Exhibition in school?

36. Ajay purchased 245 apples and Kumar purchased 1029 bananas to distribute poor people near the temple. Find the largest number which divides 245 and 1029 leaving remainder 5 in each case. Which values depicted from this?

37. Aditya distributed clothes to 2053 poor children and his friend also distributed clothes to 967 poor children. Find the largest number which divides 2053 and 967 and leaves a remainder of 5 and 7 respectively. Which values depicted from this?

38. Any contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march? How Army is helping our country?

39. 15 pastries and 12 biscuit packets have been donated for a school fete. These are to be packed in several smaller identical boxes with the same number of pastries and biscuit packets in each. How many biscuit packets and how many pastries will each box contain? Which value depicted from this?

40. Nitin distributed food to 2011 poor children and his friend also distributed food to 2623 poor children. Find the greatest number which divides 2011 and 2623 and leaving remainders 9 and 5 respectively. Which values depicted from this?

CHAPTER – 2
POLYNOMIALS

1. If α be the number of cashew nuts , β be the number of almonds and α, β are the zeroes of the $x^2 + 7x + 7$, then find the value of $\frac{1}{\alpha}+\frac{1}{\beta}-2\alpha\beta$. What are the benefits of dry foods for good health?

2. If α be the number of persons who take junk food , β be the number of persons who take home at food and α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 3x - 2$, then find a quadratic polynomial whose zeroes are $\frac{1}{2\alpha+\beta}$ and $\frac{1}{2\beta+\alpha}$. Which way of taking food you prefer and why?

3. If k is the number of honest persons so that $x^2 + 2x + k$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Find k and also find all the zeroes of the two polynomials. Do you prefer the value shown here and why?

4. A School has decided to award prizes to their students for three values honesty (α), punctuality (β) and obedience (γ). School decided to give 2 prize for punctuality, 3 prizes for honesty and 1 prize for obedience. Find a cubic polynomial whose zeroes are depicting the number of prizes for honesty, punctuality and obedience. Which value you prefer to be rewarded most and why?

5. A group consists of 12 honest people and 8 dishonest people. Write a quadratic polynomial whose roots are equal to number of honest people and number of dishonest people. Which value do you prefer?

6. Given that the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form a, a + b, a + 2b for some real numbers a and b where a is the number of people who believes in Yoga and b is the number of people who believes in Gym, find the values of a and b as well as the zeroes of the given polynomial. Why exercise is important for good health?

7. If the number of apples and mangoes are the zeroes of the polynomial $3x^2 = 8x - 2k + 1$ and the number of apples is seven times the number of mangoes, then find the number of zeroes and value of k. What are benefits of fruits in our daily life?

8. Manish engages a labour to get some repair work. Charges to be paid for this work are zeroes of the polynomial $x^2 - 300x + 22500$. (i) Find the zeroes of the polynomial. (ii) Labour claims Rs. 125 for the whole work. Manish paid the actual amount. What value is depicted by Manish?

9. Sum of zeroes of the polynomial $2x^2 - 4x + 5$ is 4. Navdeep at once said "it is false" (a) Do you agree with Navdeep? Justify. (b) What value is depicted by Navdeep?

10. If the number of apples distributed to poor children are the zeroes of the polynomial $2x^3 - x^2 - 5x - 2$ and two of its zeroes are –1 and 2, then find the other zeroes. Which value depicted from this?

11. If a and b are the number of poor children in the school such that the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be (ax + b), find a and b. How we can help those poor children?

12. Ajay donates Rs. p and Manoj donates Rs. q to Cancer Aid Society such that the polynomial $x^4 + 2x^3 + 8x^2 + 12x + 18$ is divided by another polynomial $x^2 + 5$, the remainder comes out to be px + q, find the value of p and q. Which value is depicted from this?

13. Kumar helped his friend by giving Rs. 5 to him to purchase pen and Aditya helped a poor child by giving Rs. 7 to purchase food. Find a quadratic polynomial, the sum and product of whose zeroes are 5 and 7 respectively. Which values depicted from this?

14. If the zeroes of the quadratic polynomial $x^2 - 5x + 6$ are the number of poor children in Class IX and X respectively then find the zeroes and verify the relationship between the zeroes and the coefficients. How we can poor children in the school?

15. If 'k' is the number of honest students in the Class X such that one zero of the quadratic polynomial $x^2 - 5x + k$ is 2, then find the value of *k.* Which values depicted from this?

16. If the number of poor children in Class IX, X, XI and XII are the zeroes of $x^4 - 7x^3 + 17x^2 - 17x + 6$ and if two of its zeroes are 3 and 1. find the other zeroes. How we can help the poor children?

17. If 'k' is the number of poor children not able to attend the school and if the remainder on division of $x^3 + 2x^2 + kx + 3$ by $x - 3$ is 21, find the quotient and the value of *k*. Hence, find the zeroes of the cubic polynomial $x^3 + 2x^2 + kx - 18$. How we can help those poor children?

18. If the zeroes of the polynomial $f(x) = x^3 - 5x^2 - 2x + 24$ are the number of students not work hard in studies, if it is given that the product of two zeroes is 12. Find the zeroes of the polynomial f(x). What you have to do for success in studies?

19. If the number of different fruits are the zeroes of the polynomial $f(x) = x^3 - 5x^2 - 16x + 80$ and if its two zeroes are equal in magnitude but opposite in sign then find the zeroes. What are the benefits of fruits in our daily life?

20. If 'a' is the number of apples and 'b' is the number of bananas such that the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are $a - b$, a, $a + b$, find a and b. How fruits are helpful for a good health?

21. If 'a' is the number of students who prefers exercise in the morning and 'b' is the number of students who prefers exercise in the evening such that the zeroes of the polynomial $2x^3 - 15x^2 + 37x - 30$ are $a - b$, a, $a + b$, find all the zeroes. How exercise is helpful to us?

22. If 'a' is the number of apples and 'b' is the number of oranges such that the zeroes of the polynomial $x^3 - 12x^2 + 39x - 28$ are $a - b$, a, $a + b$, find all the zeroes. How fruits are helpful for a good health?

23. If the work of Cancer Aid Society is represented by $p(x) = 4x^3 + 2x^2 + 5x - 6$ and the work of Help Age India is represented by $g(x) = 2x^2 + 3x + 1$. Find the quotient and remainder when p(x) is divided by g(x). Which values depicted from this?

24. A, B and C donates Rs. 2, Rs. 3 and Rs. 1 to poor people near the temple respectively. Find a cubic polynomial whose zeroes are 2, 3 and 1. Which values depicted from this?

25. Ajay, Deepka and Chetan donates 3 pens, 5 pencils and 2 books each to poor children respectively. Find a cubic polynomial whose zeroes are 3, 5 and 2. Which values depicted from this?

26. If α be the number of persons who take junk food , β be the number of persons who take home at food and α and β are the zeroes of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, then find a quadratic polynomial whose zeroes are $2\alpha + 3\beta$ and $2\beta + 3\alpha$ .. Which way of taking food you prefer and why?

27. A School has decided to award prizes to their students for three values honesty (α), punctuality (β) and obedience (γ). School decided to give 4 prizes for punctuality, 2 prizes for honesty and 3 prizes for obedience. Find a cubic polynomial whose zeroes are depicting the number of prizes for honesty, punctuality and obedience. Which value you prefer to be rewarded most and why?

28. If α be the number of persons who take fruit juice, β be the number of persons who take cold drink and α and β are the zeroes of the quadratic polynomial $f(x) = 6x^2 + x - 2$, then find a quadratic polynomial whose zeroes are $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$. Which way of taking drink you prefer and why?

29. If α be the number of persons who take fruit juice, β be the number of persons who take cold drink and α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 3$, then find a quadratic polynomial whose zeroes are $\alpha + 2$ and $\beta + 2$. Which way of taking drink you prefer and why?

30. If A donates Rs. α and B donates Rs. β to poor people near the temple such that α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 5x + 4$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$. Which value depicted from this?

31. If Ajay donates Rs. α and Goutam donates Rs. β to Help Age India such that α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 5x + 4$, then find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$. Which value depicted from this?

32. If α be the number of persons who take fruit juice, β be the number of persons who take cold drink and α and β are the zeroes of the quadratic polynomial $f(x) = 6x^2 + x - 2$, then find a quadratic polynomial whose zeroes are $\frac{\alpha - 1}{\alpha + 1}$ and $\frac{\beta - 1}{\beta + 1}$.Which way of taking drink you prefer and why?

33. If α be the number of persons who take fruit juice, β be the number of persons who take cold drink and α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 3$, then find a quadratic polynomial whose zeroes are $\frac{\alpha^2}{\beta}$ and $\frac{\beta^2}{\alpha}$. Which way of taking drink you prefer and why?

34. If A donates Rs. α and B donates Rs. β to poor people near the temple such that α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 3x + 4$, then find the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$. Which value depicted from this?

35. If Ajay donates Rs. α and Goutam donates Rs. β to Help Age India such that α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - x + 5$, then find the value of $\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2}$. Which value depicted from this?

36. If the number of marks obtained in participating in seminar are the zeroes of the polynomial $f(x) = x^3 - 5x^2 - 2x + 24$ and it is is given that the product of

its two zeroes is 12 then find the zeroes of f(x). What are benefits of delivering the seminar?

37. If the number of honest students 'α' and dishonest student 'β' are zeroes of the quadratic polynomial $x^2 - (k + 6)x + 2(2k - 1)$. Find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$. Which value you prefer and why?

38. If 'α' is the number of students who prefers donation to the Help Age India and 'β' is the number of students who do not prefers donation and also α and β are the zeroes of the quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, find a quadratic polynomial having α and β as its zeroes. Which value depicted from this?

39. If 'α' is the percentage of students who prefers morning exercise and 'β' is the percentage of students who prefers evening exercise and also α and β are the zeroes of the quadratic polynomial $f(x) = 2x^2 + 5x + k$ such that $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, find the value of k.. What are the benefits of exercise in our daily life?

40. If 'k' is the number of poor children in the school such that sum of the squares of zeroes of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k.. How you can help poor children in the school?

CHAPTER – 3
PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

1. Mohit and Sahil are driving on two roads represented by the equation $2x + 3y = 7$ and $4x + 6y = 12$. They drive within the speed limit. (a) Will they meet at some point? Justify your answer. (b) What value is depicted by Mohit and Sahil?

2. 5 books and 7 pens together cost Rs. 285. 4 books and 4 pens together cost Rs. 220. Monu purchased 3 books and 5 pens and calculated total cost to be Rs. 195. He paid Rs. 195 to the shopkeeper. Shopkeeper rechecked and returned some money to Monu. (a) How much money did shopkeeper returned to Monu? (b) What value is depicted by the shopkeeper?

3. A test consists of 'True' and 'False' questions. One mark is awarded for every correct answer while ¼ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by cheating. He answered 120 questions and got 90 marks. If answer to all questions he attempted by cheating were wrong, then how many questions did he answer correctly? How the habit of cheating will affect his character building?

4. A man wished to donate some money to a group of poor people, he decided to give Rs. 120 to each person and found that he fell short of Rs. 60, when he wanted to give to all the people present. He, therefore, distributed Rs. 90 to each person and found that Rs. 90 were left over. How much money did he have and how many people were there?

5. A trust has Rs. 30,000. It is invested in two different types of bonds. The first bond pays 5% interest per annum which will be given to orphanage and second bond pays 7% interest per annum which will be given to an NGO for cancer aid. Trust obtains an annual interest of Rs. 1800. (a) How much amount is invested in each type of bond? (b) Which value is depicted by trust?

6. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars? Which speed you prefer while driving in a city and why?

7. A rectangular sign board used to display the logo "WATER IS PRECIOUS. SAVE WATER". The area of a rectangular sign board remains the same if the length is increased by 7m and the breadth is decreased by 3m. The area remains unaffected if the length is decreased by 7m and the breadth is increased by 5m. Find the dimensions of the rectangular sign board. Which value depicted from this?

8. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h; it would have taken 3 hours more than the scheduled time. Find the distance covered by the train. What are the benefits of time management in our daily life?

9. The length of a room designed for accommodation of poor children in the school exceeds its breadth by 3 metres. If the length is increased by 3 metres and the breadth is decreased by 2 metres, the area remains the same. Find the length and the breadth of the room. Which value depicted from this?

10. A rectangular sign board used to display the logo "GO GREEN. SAVE TREES". The area of a rectangular sign board remains the same if the length is increased by 7m and the breadth is decreased by 3m. The area remains unaffected if the length is decreased by 7m and the breadth is increased by 5m. Find the dimensions of the rectangular sign board. Which value depicted from this?

11. 8 men and 12 boys can finish a piece of work for needy people in 10 days while 6 men and 8 boys finish it in 14 days. Find the time taken by one man alone and by one boy alone to finish the work. Which value depicted from this?

12. One says, "Give me a hundred, friend! I shall then become twice as rich as you". The other replies, "If you give me ten, friend! I shall be six times as rich as you". Tell me what is the amount of their (respective) capital? Which value depicted from this?

13. The students of a class are made to stand in rows for Yoga. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class. What are the benefits of Yoga in our daily life?

14. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test? His friend suggested him not to attempt the questions which he does not know. What is your opinion in this regard and why?

15. The cost of 5 oranges and 3 apples is Rs 35 and the cost of 2 oranges and 4 apples is Rs 28. Find the cost of an orange and an apple. What are benefits of fruits?

16. From a bus stand in Bangalore , if we buy 2 tickets to Malleswaram and 3 tickets to Yeshwanthpur, the total cost is Rs 46; but if we buy 3 tickets to Malleswaram and 5 tickets to Yeshwanthpur the total cost is Rs 74. Find the fares from the bus stand to Malleswaram, and to Yeshwanthpur. What do you prefer Public transport or taxi? Why?

17. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day. What are the importance of Library in the school?

18. The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save Rs 2000 per month, find their monthly incomes. Mention any three way of savings from the income.

19. Meena went to a bank to withdraw Rs 2000. She asked the cashier to give her Rs 50 and Rs 100 notes only. Meena got 25 notes in all. Find how many notes of Rs 50 and Rs 100 she received. What do you prefer Private or Government bank? Why?

20. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs 105 and for a journey of 15 km, the charge paid is Rs 155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km? What do you prefer Public transport or taxi? Why?

21. The coach of a cricket team buys 7 bats and 6 balls for Rs 3800. Later, she buys 3 bats and 5 balls for Rs 1750. Find the cost of each bat and each ball. What are the benefits of sports and games in our daily life?

22. The students of a class are made to stand in rows for Yoga. If 4 students are extra in a row, there would be 2 rows less. If 4 students are less in a row, there would be 4 rows more. Find the number of students in the class. What are the benefits of Yoga in our daily life?

23. Roohi travels 300 km to her home partly by train and partly by bus. She takes 4 hours if she travels 60 km by train and the remaining by bus. If she travels 100 km by train and the remaining by bus, she takes 10 minutes longer. Find the speed of the train and the bus separately. Which situation you prefer and why?

24. The cost of 2 apples and 3 oranges is Rs 9 and the cost of 4 apples and 6 oranges is Rs 18. Find the cost of each apple and each orange. Mention the importance of fruits in our daily life.

25. 5 pineapples and 7 bananas together cost Rs 50, whereas 7 pineapples and 5 bananas together cost Rs 46. Find the cost of one pineapple and that of one banana. What are the importance of fruits in our daily life?

26. If 'x' is the number of honest students and 'y' is the number of dishonest students such that 11x + 15y + 23 = 0; 7x – 2y – 20 = 0 then find 'x' and 'y'. Which value depicted from this?

27. If Ram donated 'x' number of clothes and 'y' number of foods to the poor people near the temple such that 2x – 3y = 13; 7x – 2y = 20 then find 'x' and 'y'. Which value depicted from this?

28. If Ajay donated Rs. x and Manoj donated Rs. y such that 2x – 3y + 8 = 0; x – 4y + 7 = 0 then find 'x' and 'y'. Which value depicted from this?.

29. If the percentage of donating clothes and foods by Aditya is 'x' and 'y' respectively such that $47x+31y=63; 31x+47y=15$ then find 'x' and 'y'. Which value depicted from this?.

30. If 'x' is the number of honest students and 'y' is the number of dishonest student such that 71x + 37y = 253; 37x + 71y = 287 then find 'x' and 'y'. Which value depicted from this?.

31. A and B are two friends. They are collecting money for flood affected people. A and B collected Rs. x and Rs. y respectively such that to 37x + 43y = 123; 43x + 37y = 117 then find 'x' and 'y'. Which value depicted from this?.

32. If the number of apples is x and the number of oranges is y such that 217x + 131y = 913; 131x + 217y = 827 then find 'x' and 'y'. What are the advantages of fruits?.

33. If the percentage of boys and girls participants in seminar is x and y respectively such that 41x – 17y = 99; 17x – 41y = 75 then find 'x' and 'y'. What are the advantage of delivering the seminar?

34. The triangular sign board is used to display "SAVE ENVIRONMENT". Find the Find the coordinates of the vertices of the triangle formed by the lines $4x-3y+4=0;\quad 4x+3y-20=0$ and y-axis. Which value depicted by this?

35. The triangular sign board is used to display "SAVE WATER". Find the Find the coordinates of the vertices of the triangle formed by the lines $4x-5y-20=0;\quad 3x+5y-15=0$ and y-axis. Which value depicted by this?

36. The triangular sign board is used to display "GO GREEN". Find the Find the coordinates of the vertices of the triangle formed by the lines $4x-5y+16=0;\quad 2x+y-6=0$ and y-axis. Which value depicted by this?

37. The triangular sign board is used to display "SAVE GIRL CHILD". Find the Find the coordinates of the vertices of the triangle formed by the lines $4x-3y+4=0;\quad 4x+3y-20=0$ and x-axis. Which value depicted by this?

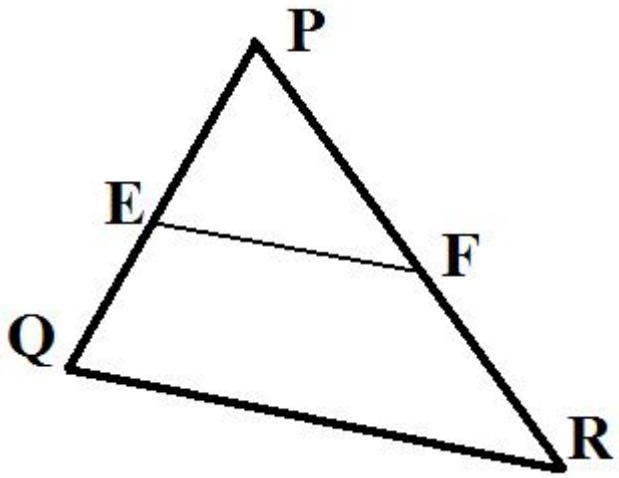
38. The number of poor children is a two digit number such that seven times this two-digit number is equal to four times the number obtained by reversing the order of its digit. If the difference between the digits is 3, then find the number. How you can help the poor children?

39. Ajay donates the amount to Cancer Aid Society which is a two digit number such that the sum of this two-digit number and the number formed by interchanging its digit is 110. If 10 is subtracted from the original number, the new number is 4 more than 5 times the sum of the digits of the original number. Find the amount. Which value depicted from this?

40. Kumar and Aditya are two friends. They collected the amount for contributing in Flood relief fund which is a two digit number such that this two-digit number is 3 more than 4 times the sum of its digit. If 18 is added to the number, the digits are reversed. Find the amount. Which value depicted from this?

CHAPTER – 6
TRIANGLES

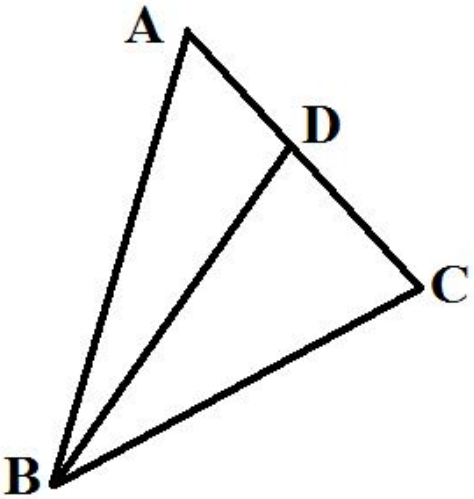
1. Kitchen garden of Ms. Sanjana is in the form of a triangle as shown. She wants to divide it in two parts; one triangle and one trapezium.



She takes PE = 4m, QE = 4.5 m, PF = 8m and RF = 9m. (a) Is EF || QR ? Justify your answer (b) What values are depicted by Ms. Sanajana?

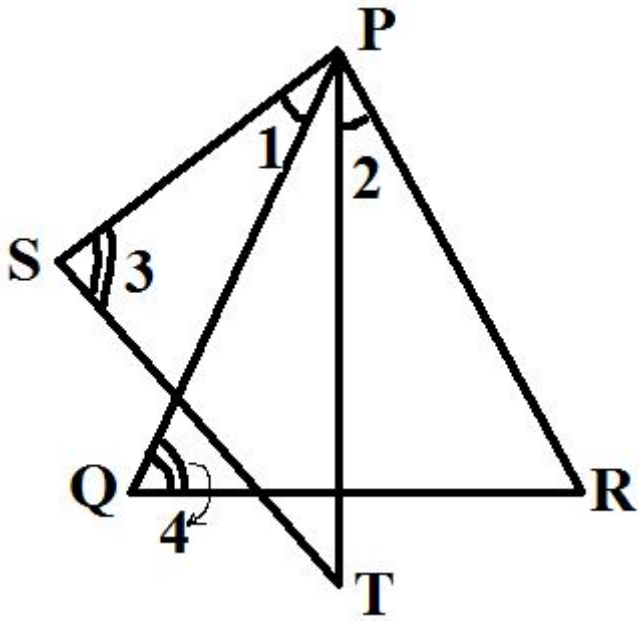
2. An old man was trying to place a ladder 13m long in such a way that it reaches a window of a building 12m above the ground. Anoop decided to help the old man. He placed the foot of the ladder at such a distance from the wall that the top of ladder reached the window. (a) Find the distance of the foot of ladder from the wall. (b) What value is depicted by Anoop?

3. Students of a school decided to participate in "Save girl child" campaign. They decided to decorate a triangular path as shown :



(a) If AB = AC, BC^2 = AC x CD, prove that BD = BC. (b) What value is depicted by the students?

4. On occasion of independence day, Mira made a Rangoli in a design as shown



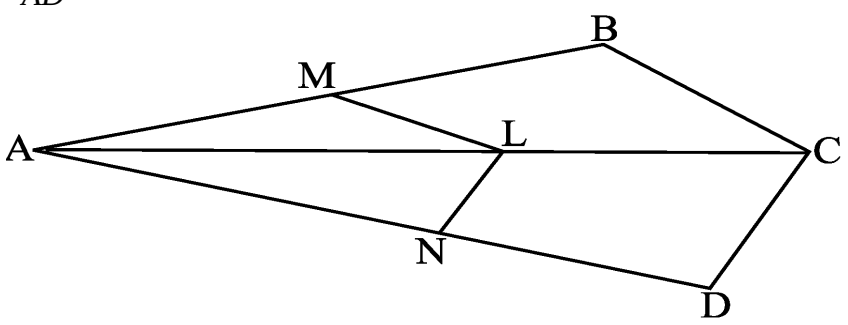
(a) If $\angle 1 = \angle 2$, $\angle 3 = \angle 4$, show that PT. QR = PR. ST. (b) What value is depicted by Mira?

5. A craft mela is organised by Welfare Association to promote the art and culture of tribal people. They have to arrange it in a triangular field ABC such that $\frac{AD}{DB} = \frac{AE}{EC}$ and $\angle AED = \angle ABC$. Show that AB = AC. Which value depicted from this?

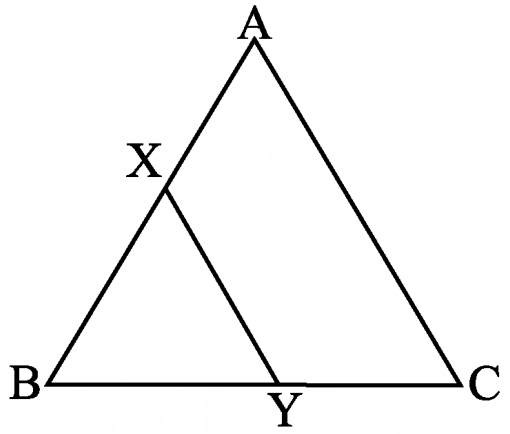
6. A programme is organized by School to promote the awareness of AIDS in two triangular fields ABC and DEF such that $\Delta ABC \sim \Delta DEF$, such that ar($\Delta ABC$) = 64 cm^2 and ar(ΔDEF) = 121 cm^2. If EF = 15.4 cm, find BC. Which value depicted from this?

7. In a rangoli competition, two students have completed their rangoli in two equilateral triangular areas ABC and BDE such that D is the midpoint of BC. What is the ratio of the areas of triangles ABC and BDE. Which value depicted from this?

8. A welfare programme organized to arranged some money for flood relief fund in a below figure plot, if LM || CB and LN || CD, prove that $\frac{AM}{AB} = \frac{AN}{AD}$. Which value depicted from this?



9. A welfare programme organized to arranged some money for Cancer Aided Society Fund in a below figure plot, the line segment XY is parallel to side AC of ΔABC and it divides the triangle into two equal parts of equal areas. Find the ratio $\frac{AX}{AB}$. Which value is depicted?



10. A plot is in the form of trapezium ABCD in which AB || DC and its diagonals intersect each other at the point O. Owner of this plot wants to build OLD AGE HOME, DISPENSARY, PARK and HEALTH CENTRE for elderly people. Show that $\frac{AO}{BO} = \frac{CO}{DO}$. Which value depicted from this?

11. For 'Sarva Shiksha Abhiyan' a rally was organised by a school. Students were given triangular cardboard pieces to write slogans. D is a point on the side BC of a triangular cardboard ABC such that ∠ADC = ∠BAC. Show that $CA^2 = CB.CD$. Which value depicted from this?

12. For "Global warming", Students were given triangular cardboard pieces to write slogans. Sides AB and BC and median AD of a triangular cardboard ABC are respectively proportional to sides PQ and QR and median PM of another triangular cardboard ΔPQR. Show that ΔABC ~ ΔPQR. Which value depicted from this?

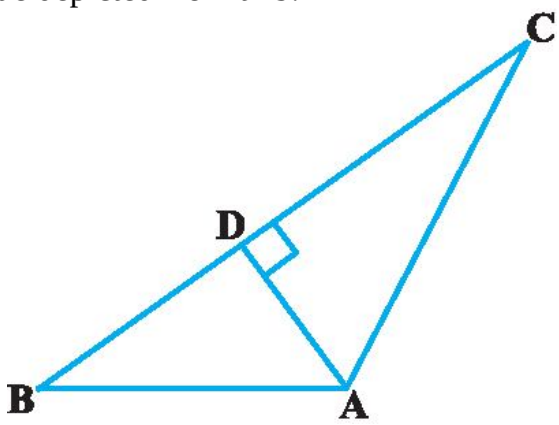
13. For display board competition, Students were given triangular cardboard pieces to write articles. Sides AB and AC and median AD of a triangular cardboard ABC are respectively proportional to sides PQ and PR and median PM of another triangular cardboard PQR. Show that ΔABC ~ ΔPQR. What are the benefits to participate in competitions organized in school?

14. For Bulletin board competition, Students were given triangular cardboard pieces to write articles on Independence Day. If AD and PM are medians of triangular cardboard ABC and PQR, respectively where ΔABC ~ ΔPQR, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$. Which value depicted from this?

15. On National Integration day a poster is to be made by class X students of a school. All religions have been given equal triangular spaces to display their teachings. It is given that Δ ABC ~ Δ EDF such that AB = 5 cm, AC = 7 cm, DF= 15 cm and DE = 12 cm. Find the lengths of the remaining sides of the triangles. Which value depicted from this?

16. A flag of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower. Mention any two ways in which every citizen of India should respect the national flag.

17. The triangular signboard ABC is used to display "SAVE ENVIRONMENT". In Fig., if AD $\perp$ BC, prove that $AB^2 + CD^2 = BD^2 + AC^2$. Which value depicted from this?



18. A farmer has a square plot of land where he wants to grow five different crops at a time. On half of the area in the middle he wants to grow wheat but in rest four equal triangular parts he wants to grow different crops. BL and CM are medians of a triangular part ABC right angled at A. Prove that $4(BL^2 + CM^2) = 5\ BC^2$. By using this crop pattern which values are depicted by the farmer?

19. The triangular signboard ABC is used to display "SAVE WATER". D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$. Which value depicted from this?

20. The triangular signboard ABC is used to display "GO GREEN". The perpendicular from A on side BC of a ΔABC intersects BC at D such that DB = 3 CD. Prove that $2AB^2 = 2AC^2 + BC^2$. Which value depicted from this?

21. On Republic day a poster is to be made by class X students of a school. All religions have been given equal right triangular spaces to display their teachings. Hypotenuse of a right triangle is 25 cm and out of the remaining two sides, one is longer than the other by 5 cm. Find the lengths of the other two sides. Which value depicted from this?

22. Two triangular sign boards ABC and DEF used to display "WORLD ENVIRNMENT DAY". If Δ ABC ~ Δ DEF, AB = 4 cm, DE = 6 cm, EF = 9 cm and FD = 12 cm, find the perimeter of Δ ABC. Which value depicted from this?

23. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. How far apart will be the two planes after $1^{1/2}$ hours? Which aeroplane you prefer and why?

24. A 15 metres high tower casts a shadow 24 metres long at a certain time and at the same time, a flag casts a shadow 16 metres long. Find the height of the flag. What are the ways in which every citizen of India should respect the national flag.

25. Two similar triangular sign boards are used for display board competition to display slogan on "TEACHER'S DAY" such that areas of two triangles are 36 cm^2 and 100 cm^2. If the length of a side of the larger triangle is 20 cm, find the length of the corresponding side of the smaller triangle. What is the role of teachers in the society?

26. Foot of a 10 m long ladder leaning against a vertical wall on which one slogan "SAVE EARTH" is written is 6 m away from the base of the wall. Find the height of the point on the wall where the top of the ladder reaches. Which value depicted from this?

27. An aeroplane leaves an Airport and flies due North at 300 km/h. At the same time, another aeroplane leaves the same Airport and flies due West at 400 km/h. How far apart the two aeroplanes would be after $1\frac{1}{2}$ hours? What are the advantages of time management?

28. A 5 m long ladder is placed leaning towards a vertical wall on which one slogan "SAVE TREES" such that it reaches the wall at a point 4 m high. If the foot of the ladder is moved 1.6 m towards the wall, then find the distance by which the top of the ladder would slide upwards on the wall. Which value depicted from this?

29. The triangular signboard ABC is used to display "SAVE GIRL CHILD" such that DE || BC and $\frac{AD}{DB} = \frac{3}{5}$.If AC = 4.8 cm, find AE. Which value depicted from this?

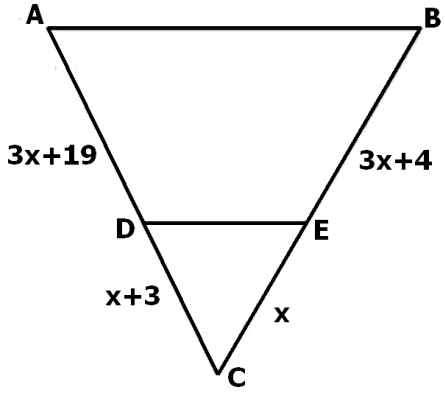
30. On Independence day a poster is to be made by class X students of a school. All religions have been given equal triangular spaces to display their teachings. In a triangle PQR, PD $\perp$ QR such that D lies on QR . If PQ = a, PR = b, QD = c and DR = d, prove that $(a + b)(a - b) = (c + d)(c - d)$. Which value depicted from this?

31. There is a plot in a village in the shape of a trapezium ABCD. Sarpanch wants to get floor cemented so as to use it for social gatherings and panchayat meetings. Diagonals of a trapezium PQRS intersect each other at the point O, PQ || RS and PQ = 3 RS. Find the ratio of the areas of triangles POQ and ROS. What are the values depicted from this activities?

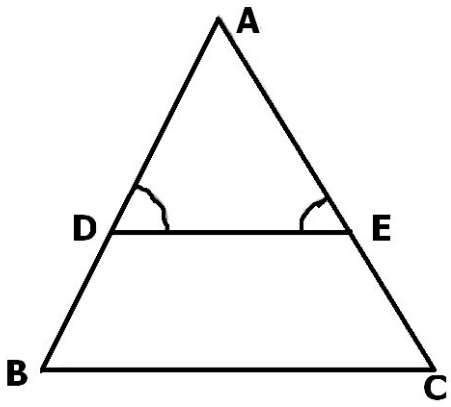
32. The equilateral triangular signboard ABC is used to display "SAVE ENVIRONMENT". Find the altitude of an equilateral triangle of side 8 cm. Which value depicted from this?

33. A poor girl is studying under the lamp post as there is no light in her house. Her height is 90 cm and she is walking away from the base of a lamp post at a speed of 1.2m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds. How can you help the poor children?

34. The triangular signboard ABC is used to display "SAVE WATER. WATER IS PRECIOUS". Find the value of x for which DE || AB in the below figure. Which value depicted from this?



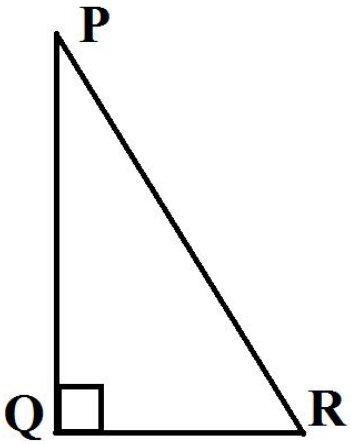
35. The triangular signboard ABC is used to display "GO GREEN" such that $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$. Prove that BAC is an isosceles triangle. Which value depicted from this?



CHAPTER – 8
TRIGONOMETRY

1. Ajay prepared a triangular display board ABC, right angled at B which represents the ideologies of Gandhiji on the occasion of Gandhi Jayanti in the School. If cosA = $\frac{1}{2}$, find the value of $\frac{2\sec A}{1+\tan^2 A}$. Which value of Ajay is depicted from this?

2. The triangular signboard PQR right-angled at Q is used to display "GO GREEN" (see below figure) such that PR + QR = 25 cm and PQ = 5 cm, then the value of sin P, cos P and tan P. Which value depicted from this?



3. Aditya prepared a triangular display board ABC, right angled at B which represents the ideologies of Netali Subhash Chandra Bose on the occasion of Independence Day in the School such that AB = 12 cm and BC = 5cm. Find the value of cosA, cosecA, cosC and cosecC. Which value of Aditya is depicted from this?

4. In a triangular display board ACB, right-angled at C, Manoj prepared article on "SAVE NATURAL RESOURCES" such that AB = 29 units, BC = 21 units and $\angle ABC = \theta$. Determine the values of (i) $(\cos\theta + \sin\theta)^2$ (ii) $\cos^2\theta - \sin^2\theta$. Which value of Manoj is depicted from this?

5. For "Global warming", Students were given triangular cardboard pieces ABC to write slogans such that $\angle B = 90^0$, AB = 24 cm and BC = 7 cm. Find (i) SinA, CosA (ii) SinC, CosC. Which value depicted from this?

6. A programme is organized by School to promote the awareness of AIDS in a triangular field ABC. If tan (A – B) = $\frac{1}{\sqrt{3}}$ and tan (A + B) = $\sqrt{3}$, then find the value of A and B. Which value depicted from this?

7. For display board competition, Students were given triangular cardboard pieces ABC right angled at B to write articles. If A = 30^0, verify that:

(i) $\sin 2A = \dfrac{2\tan A}{1+\tan^2 A}$

(ii) $\cos 2A = \dfrac{1-\tan^2 A}{1+\tan^2 A}$

(iii) $\tan 2A = \dfrac{2\tan A}{1-\tan^2 A}$

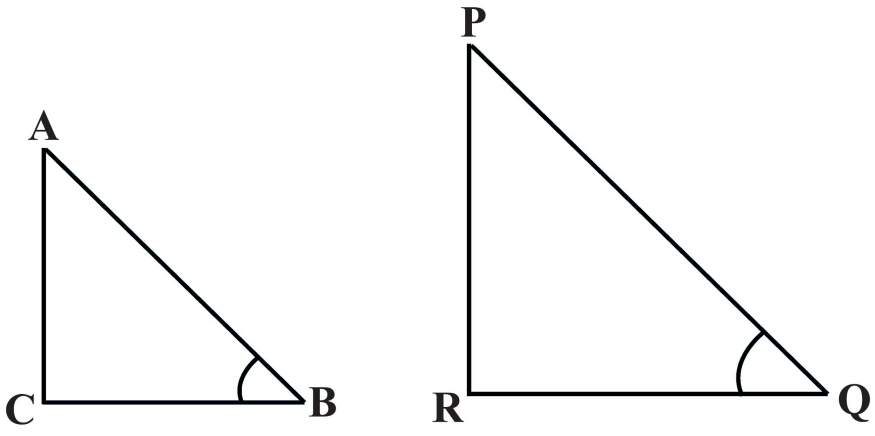
What are the benefits of participating in the competitions in the school?

8. For 'Sarva Shiksha Abhiyan' a rally was organised by a school. Students were given triangular cardboard pieces ABC to write slogans. If sin (A + B) = 1 and cos(A – B) = 1, then find the value of A and B. Which value depicted from this?

9. For Bulletin board competition, Students were given triangular cardboard pieces ABC to write articles on Independence Day. If A and B are acute angles such that tanA = $\dfrac{1}{3}$, tanB = $\dfrac{1}{2}$ and $\tan(A+B) = \dfrac{\tan A + \tan B}{1-\tan A \tan B}$, show that A + B = 45^0. Which value depicted from this?

10. The triangular signboard ABC is used to display "SAVE WATER". If A, B and C are the interior angles of triangle ABC, prove that $\tan\left(\dfrac{B+C}{2}\right) = \cot\dfrac{A}{2}$. Which value depicted from this?

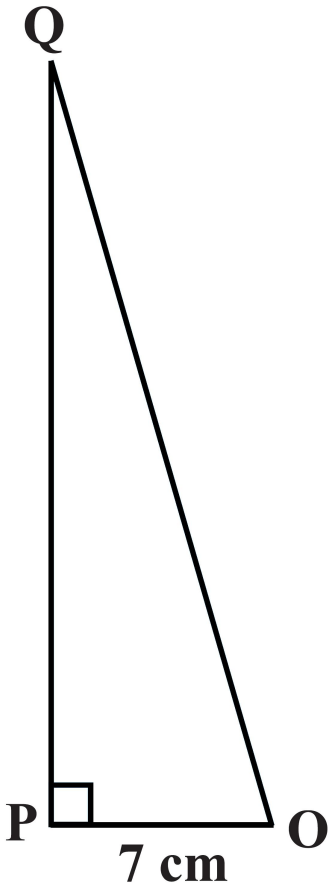
11. Aditi donate her two triangular plots ABC and PQR (see given below figure) for Children's park for poor children. If $\angle$B and $\angle$Q are acute angles such that sin B = sin Q, then prove that $\angle$B = $\angle$Q. Which value id depicted from this?



12. The triangular display board ABC has been used by students of Class X on "TEACHER'S DAY". If A, B, C are interior angles of a ΔABC, then show that $\cos ec\left(\dfrac{A+C}{2}\right) = \sec\dfrac{B}{2}$. What are the important role of teachers in the society?

13. A school is going to reward awards for co-curricular activities and arranged the programme in a triangular region ABC. If A, B, C are interior angles of a ΔABC, then show that $\cot\left(\frac{B+A}{2}\right) = \tan\frac{C}{2}$. What are the important role of co-curricular activities in the school?

14. A welfare programme organized to arranged some money for Cancer Aided Society Fund in a below triangular figure plot PQR, right-angled at P such that OP = 7 cm and OQ – PQ = 1 cm. Determine the values of sin Q and cos Q.. Which value is depicted from this?



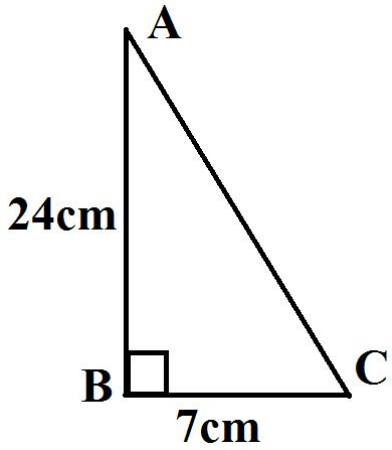
15. The triangular signboard ABC is used to display "GO GREEN". If A, B, C are interior angles of a ΔABC, then show that $\cos\left(\frac{B+C}{2}\right) = \sin\frac{A}{2}$. Which value depicted from this?

16. School is organised slogan writing competition on 'SAVE WILD LIFE' and provides each children a triangular board ABC, right-angled at B to display. If tan A = $\frac{1}{\sqrt{3}}$, find the value of:

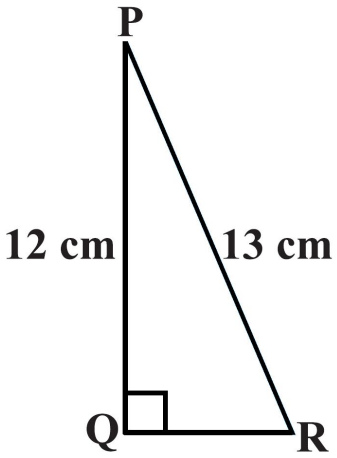
(i) sin A cos C + cos A sin C
(ii) cos A cos C – sin A sin C.
Which value depicted from this?

17. A trust purchased a triangular land ABC for orphan children. right-angled at B, AB = 24 cm, BC = 7 cm. Determine :

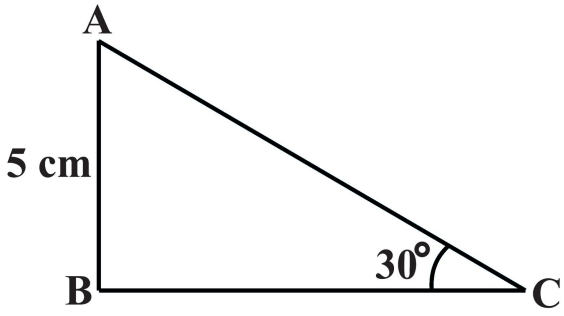
(i) sin A, cos A
(ii) sin C, cos C.
What are the values reflected in the question?



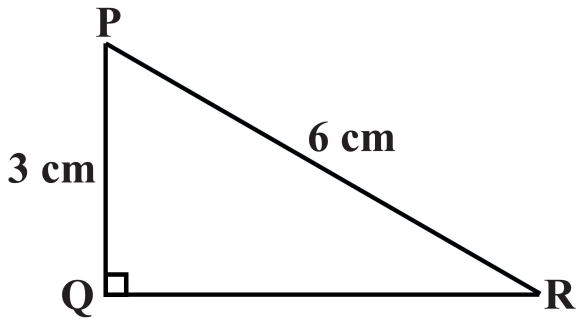
18. A welfare programme organized to arranged some money for orphan children in a below triangular figure plot PQR, right-angled at P such that PQ = 12 cm and PR = 13 cm, find the value of tan P – cot R. Why is it required to help orphan children?



19. For 'AIDS Awareness' a rally was organised by a school. Students were given triangular cardboard pieces ABC right-angled at B to write slogans, AB = 5 cm and ∠ACB = 30° (see the below figure). Determine the lengths of the sides BC and AC. Which value depicted from this?



20. A programme was organised by a school on "WORLD ENVIRONMENT DAY". Students were given triangular cardboard pieces PQR right-angled at Q to write slogans, (see the below figure), PQ = 3 cm and PR = 6 cm. Determine ∠QPR and ∠PRQ. Which value depicted from this?



21. Two friends are doing exercise in a triangular ground ABC. If sin 3A = cos (A – 26°), where 3A is an acute angle, find the value of A. What are benefits of exercise in our daily life?

22. Two friends are doing exercise in a triangular ground ABC. If tan 2A = cot (A – 18°), where 2A is an acute angle, find the value of A. Do you think that true friendship is important in life? How?

23. Aditya and Ajay are driving around a triangular ground and Ajay challenges to complete one round first. If sec 4A = cosec (A – 20°), where 4A is an acute angle, find the value of A. What is the hazard of rash driving in the road?

24. Gaurav donates a triangular plot ABC to rural school for playground. Express the ratios cos A, tan A and sec A in terms of sin A. Which value is depicted from this?

25. A triangular hoarding ABC displayed at the entrance of the school displaying "GO GREEN". Write all the other trigonometric ratios of ∠A in terms of sec A. Give your views in two lines about "GO GREEN".

26. If a triangular field ABC right angled at C, is used for plantation in a colony, prove that $\sqrt{\frac{\tan A\tan B+\tan A\cot B}{\sin A\sec B}-\frac{\sin^2 B}{\cos^2 A}}=\tan A$.

Why plantation of trees is necessary?

27. A farmer has a piece of land. He wishes to divide equally in two congruent triangles ABC to his two sons to maintain peace and harmony in the family. If tanA = n tanB and sinA = msinB, prove that $\cos^2 A=\frac{m^2-1}{n^2-1}$. What is the importance of equality among the people?

28. A triangular hoarding ABC in the centre of a city represents the ideologies of Gandhiji. Prove that:

$$\frac{\sin A+\cos A}{\sin A-\cos A}+\frac{\sin A-\cos A}{\sin A+\cos A}=\frac{2}{\sin^2 A-\cos^2 A}=\frac{2}{2\sin^2 A-1}=\frac{2}{1-2\cos^2 A}.$$

Write any two characteristics of Mahatma Gandhi which you adore the most?

29. All religions people are celebrating a festival in a triangular shaped garden ABC right angled at C, in a colony. If A = B = 45^0, verify that:

a) sin(A + B) = sinAcosB + cosAsinB
b) sin(A – B) = sinAcosB – cosAsinB
c) cos(A + B) = cosAcosB – sinAsinB
d) cos(A – B) = cosAcosB + sinAsinB
e) $\tan(A+B)=\frac{\tan A+\tan B}{1-\tan A\tan B}$
f) $\tan(A-B)=\frac{\tan A-\tan B}{1+\tan A\tan B}$

What is the importance of integration of different religions for our country peace?

30. A field is in the form of rectangle. A farmer has planted trees in one region and used the remaining part which is in the form of triangle ABC for playing games for children. Using the formula, $\tan 2A=\frac{2\tan A}{1-\tan^2 A}$, find the value of $\tan 60^0$, it being given that $\tan 30^0=\frac{1}{\sqrt{3}}$.

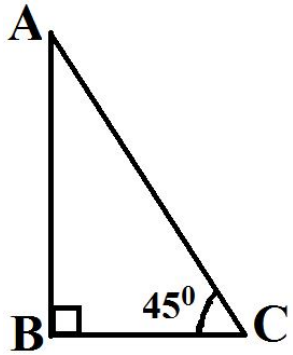
What is the importance of games in student's life

31. The students are asked to put a posters on "Child Labour" and "Education for all" in triangular shaped board ABC right angled at B. If A = 45^0, verify that

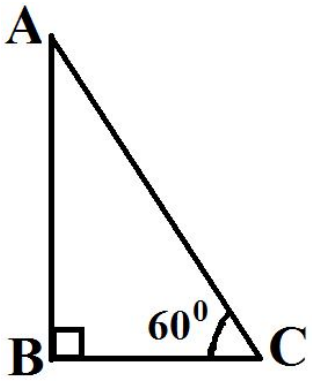
(i) sin2A = 2sinAcosA
(ii) $\cos 2A = 2\cos^2 A - 1 = 1 - 2\sin^2 A$

Which theme according to you deserves a bigger space? Justify.

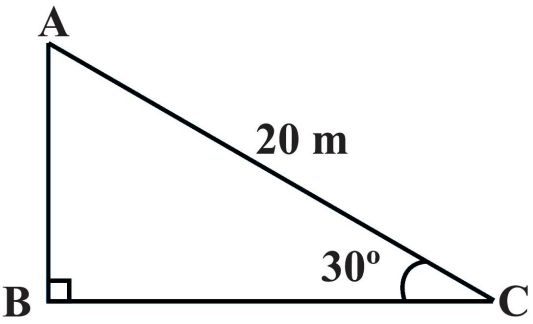
32. A boy sees an injured cat on a window sill 20m at point A above the ground. To help the cat the boy takes the staircase AC at an angle of 45^0(see below figure). What is the distance the boy has to cover to reach the cat? What are the qualities the boy projects to help the cat?



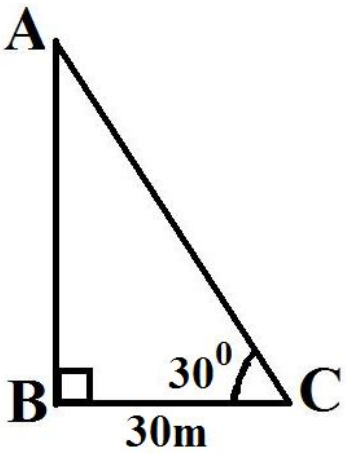
33. A flag AB stands vertically on the ground. From a point 'C' on the ground, which is 15 m away from the foot of the tower, the angle of the top of the tower with ground is found to be 60° (See below figure). Find the height of the tower. Mention any two ways in which every citizen of India should respect the national flag.



34. A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is 30° (see below figure). What is the importance of concentration in studies?



35. The angle of the top of a flag from a point on the ground, which is 30 m away from the foot of the tower, is 30°. Find the height of the flag. What are the ways in which every citizen of India should respect the national flag.



CHAPTER – 14
STATISTICS

1. Daily wages of 110 child workers, obtained in a survey, are tabulated below:

Daily wages (in Rs.)	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200	200 – 220
No. of workers	15	18	25	22	18	12

Determine the mean wages of child workers. Which social value is the violating here?

2. Calculate the mean of the scores of 20 students in a mathematics test :

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	2	4	7	6	1

How will you score good marks in the examinations?

3. The following table gives the amount of donation submitted by the students in the school of orphan students:

Amount	16-18	19-21	22-24	25-27	28-30
No. of students	1	3	4	9	13

Find the mean amount of donation. Which value depicted from this?

4. The daily saving of a sample of 50 employees are tabulated as follows :

Saving (in Rs.)	1-200	201-400	401-600	601-800
No. of employees	14	15	14	7

What is the necessity of saving in the family?

5. The mileage (km per litre) of 50 cars of the same model was tested by a manufacturer and details are tabulated as given below :

Mileage(km/l)	10-12	12-14	14-16	16-18
No. of cars	7	12	18	13

Find the mean mileage. The manufacturer claimed that the mileage of the model was 16 km/litre. Do you agree with this claim?

6. Find the mean age of the poor people from the following distribution :

Age(in years)	5-14	15-24	25-34	35-44	45-54	55-64
No. of patients	6	11	21	23	14	5

How will you help the poor people?

7. The percentage of marks obtained by 100 students in an examination are given below:

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
No. of Students	14	16	18	23	18	8	3

Determine the median percentage of marks. How will you score good marks in the examinations?

8. Weekly saving of 600 families is as under:

Saving(in Rs.)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000
No. of Families	250	190	100	40	15	5

Compute the median saving. Give any two ways of saving from the income?

9. The lengths of 40 ayurvedic leaves of a plant are measured correct to the nearest millimetre, and the data obtained is represented in the following table. Find the median length of the ayurvedic leaves.

Length (in mm)	118-126	127-135	136-144	145-153	154-162	163-171	172-180
No. of leaves	3	5	9	12	5	4	2

What do you prefer Ayurvedic or allopathic medicine and why?

10. The mean amount of saving by the students of the following frequency distribution is 53. But the frequencies a and b in the classes 20-40 and 60-80 are missing. Find the missing frequencies.

Amount (in Rs.)	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	Total
Number of people	15	a	21	b	17	100

Keeping nation's growth in mind, justify the value of saving in individual life.

11. Find the median amount of donation by students of Class IX and X as per the given following frequency distribution:

Amount	61-70	71-80	81-90	91-100	101-110	111-120
No. of students	5	15	20	30	10	8

Which value is depicted from this?

12. The frequency distribution table of agriculture holdings in a village is given below:

Area of land(in ha)	1-3	3-5	5-7	79	9-11	11-13
No. of families	20	45	80	55	40	12

Find the modal agriculture holdings of the village. What are the importance of agriculture in our country?

13. The following table show the marks of 85 students of a class X in a school. Find the modal marks of the distribution:

Marks(Below)	10	20	30	40	50	60	70	80	90	100
Number of Students	5	9	17	29	45	60	70	78	83	85

Name two life skills to be successful in life.

14. A survey regarding the heights (in cms) of 50 girls of a class was conducted and the following data was obtained.

Height(in cm)	120-130	130-140	140-150	150-160	160-170	**Total**
No. of girls	2	8	12	20	8	**50**

Find the mean, median and mode of the above data.

Do you believe that a female child is neglected in backward areas? What steps will you take to restore respect of a female child in society?

15. A school is organized article writing competition on Independence day. The number of pages written by all the students are given in the form of frequency distribution table. Find the missing frequencies, if the total frequency is 100 and mode is $46\frac{2}{3}$.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	x	28	20	10	y

Which value id depicted from this?

16. For 'Sarva Shiksha Abhiyan' a rally was organised by a school. Students were given triangular cardboard pieces to write articles. The number of students page-wise written information in the form of frequency distribution is given below. If the median of the distribution given below is 14.4, find the values of *x* and *y*.

No. of pages	0 – 6	6 – 12	12 – 18	18 –24	24 – 30	Total
No. of students	4	x	5	y	1	20

Which value depicted from this?

17. Find the mean marks scored by girl students by step deviation method from the following data:

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of girl students	4	10	18	28	40	70

Do you think education of a girl child is important for the development of a society? Justify your answer.

18. Find the average number of eco-friendly vehicle from the following distribution:

Height(in cm)	160-162	163-165	166-168	169-171	172-174
No. of students	15	118	142	127	18

Do you agree we should use Eco-friendly vehicle for transportation? Why?

19. The number of students participating in the Essay writing competition organized by the "THE HINDU" as per their age distribution of a group of students is given below. Draw the cumulative frequency curve less than type and hence obtain the median from the graph.

Age (in years)	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16
No. of students	36	42	52	60	68	84	96	82	66	48	50	16

What are the benefits of participating in the competitions for students?

20. The following distribution gives the amount donated by the students of Class IX and X, draw the cumulative frequency curve more than type and hence obtain the median from the graph.

Amount(in Rs.)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	5	15	20	23	17	11	9

Which value is depicted from this?

21. The table given below shows the frequency distribution of the cores obtained by 200 candidates in a BCA examination.

Score	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600
No. of students	30	15	45	20	25	40	10	15

Draw cumulative frequency curves by using (i) less than type and (ii) more than type. Hence find median score. Name two life skills to be successful in life.

22. Draw less than and more than ogive for the following frequency distribution:

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	8	5	10	6	6	6

Also find the median from the graph and verify that by using the formula. What are the ways of getting good marks in the examination?

23. The following table gives production yield per hectare of wheat of 100 farms of a village.

Production yield (in kg/ha)	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution, and draw its ogive. What is your opinion about farmer getting maximum profit ? Do you think we should help the farmers in every way to maximise the production ?

24. During the medical check-up of 35 students of a class, their weights were recorded as follows: Draw a less than type ogive for the given data. Hence obtain the median weight from the graph and verify the result by using the formula.

Weight (in kg)	Less than 38	Less than 40	Less than 42	Less than 44	Less than 46	Less than 48	Less than 50	Less than 52
No. of students	0	3	5	9	14	28	32	35

What is the importance of medical checkup in the school?

25. For the following distribution, draw the cumulative frequency curve more than type and hence obtain the median from the graph.

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of Students	6	15	29	41	60	70

How will you score good marks in the examination?

26. The amount donated by all the students of Class IX and X for Cancer Aid Society is given below frequency distribution table. If the median of the distribution given below is 28.5, find the values of *x* and *y*.

C. I.	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total
F	5	x	20	15	y	5	100

Which value is depicted from this?

27. The following is the distribution of weights (in kg) of 40 persons:

Weight(in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
No. of persons	4	4	13	5	6	5	2	1

Construct a cumulative frequency distribution (of less than type) table for the data above. What are the disadvantages of over weight?

28. The following frequency distribution shows that the person pays the amount to all his child labour working in his company. Find the mode of the following frequency distribution:

Wages (in Rs.)	Less than 20	Less than 40	Less than 60	Less than 80	Less than 100
Number of Child labour	4	10	28	36	50

Which social value is the person violating?

29. Weekly income of 600 families is as under:

Income(in Rs.)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000
No. of Families	250	190	100	40	15	5

Compute the median income. Do you think that a person should start saving at an early age for his retirement? Can you name some avenues ?

30. All people were asked about the time they spent in a week in doing social work in their community. The following frequency distribution shows the number of people spent for social work along with number of hours spent.

No. of hours	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of people	5	10	18	30	20	12	5

What value we draw from the above data ?

31. 50 students enter for a school *javelin* throw competition. The distance (in metres) thrown are recorded below :

Distance (in m)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
No. of tudents	6	11	17	12	4

(i) Construct a cumulative frequency table.
(ii) Draw a cumulative frequency curve (less than type) and calculate the median distance thrown by using this curve.
(iii) Calculate the median distance by using the formula for median.
(iv) Are the median distance calculated in (ii) and (iii) same?
(v) What is the importance of games in student's life?

32. Size of agricultural holdings in a survey of 200 families is given in the following table:

Size of agricultural holdings (in ha)	**Number of families**
0 – 5	10
5 – 10	15
10 – 15	30
15 – 20	80
20 – 25	40
25 – 30	20
30 – 35	5

Compute median and mode size of the holdings.
What is your opinion about farmer getting maximum profit ? Do you think we should help the farmers in every way to maximise the production ?

33. School is organized slogan competition on "SAVE ENVIRONMENT" for all classes. The following frequency distribution gives the number of slogans submitted by all the students:

No. of slogans	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
No. of Students	2	3	6	7	14	12	4	2

Find the mean, mode and median. Which value is depicted from this?

34. The table below shows the salaries of 280 persons.

Salary (in thousand (Rs))	**Number of persons**
5 – 10	49
10 – 15	133
15 – 20	63
20 – 25	15
25 – 30	6
30 – 35	7
35 – 40	4
40 – 45	2
45 – 50	1

Calculate the median and mode of the data.

Keeping nation's growth in mind, justify the value of saving in individual life.

35. The following table gives the savings from income of 500 workers:

Savings (in Rs.)	**Number of workers**
1500 – 2000	24
2000 – 2500	86
2500 – 3000	90
3000 – 3500	115
3500 – 4000	95
4000 – 4500	72
4500 – 5000	18

Find the median saving. Do you think that a person should start saving at an early age for his retirement? Can you name some avenues?