

Class 10

Practice Set 1

1. Solve the following simultaneous equations.

- (1) $3a + 5b = 26$; $a + 5b = 22$
- (2) $x + 7y = 10$; $3x - 2y = 7$
- (3) $2x - 3y = 9$; $2x + y = 13$
- (4) $5m - 3n = 19$; $m - 6n = -7$
- (5) $5x + 2y = -3$; $x + 5y = 4$
- (6) $99x + 101y = 499$; $101x + 99y = 501$
- (7) $49x - 57y = 172$; $57x - 49y = 252$

Practice Set 2

(1) Two numbers differ by 3. The sum of twice the smaller number and thrice the greater number is 19. Find the numbers.

(2) The sum of father's age and twice the age of his son is 70. If we double the age of the father and add it to the age of his son the sum is 95. Find their present ages.

(3) The denominator of a fraction is 4 more than twice its numerator. Denominator becomes 12 times the numerator, if both the numerator and the denominator are reduced by 6. Find the fraction.

(4) Two types of boxes A, B are to be placed in a truck having capacity of 10 tons. When 150 boxes of type A and 100 boxes of type B are loaded in the truck, it weighs 10 tons. But when 260 boxes of type A are loaded in the truck, it can still accommodate 40 boxes of type B, so that it is fully loaded. Find the weight of each type of box.

(5) Out of 1900 km, Vishal travelled some distance by bus and some by aeroplane. Bus travels with average speed 60 km/hr and the average speed of aeroplane is 700 km/hr. It takes 5 hours to complete the journey. Find the distance, Vishal travelled by bus.

Practice Set 3

1. Write any two quadratic equations.

2. Decide which of the following are quadratic equations.

- (1) $x^2 + 5x - 2 = 0$
- (2) $y^2 = 5y - 10$
- (3) $(m + 2)(m - 5) = 0$
- (4) $m^3 + 3m^2 - 2 = 3m^3$

3. Write the following equations in the form $ax^2 + bx + c = 0$, then write the values of a, b, c for each equation.

- (1) $2y = 10 - y^2$
- (2) $(x - 1)^2 = 2x + 3$
- (3) $x^2 + 5x = -(3 - x)$
- (4) $3m^2 = 2m^2 - 9$
- (5) $P(3 + 6p) = -5$
- (6) $x^2 - 9 = 13$

4. Determine whether the values given against each of the quadratic equation are the roots of the equation.

- (1) $x^2 + 4x - 5 = 0$, $x = 1, -1$
- (2) $2m^2 - 5m = 0$, $m = 2, \frac{5}{2}$

5. Find k if $x = 3$ is a root of equation $kx^2 - 10x + 3 = 0$.

Practice Set 4

1. Solve the following quadratic equations by factorisation.

- (1) $x^2 - 15x + 54 = 0$
- (2) $x^2 + x - 20 = 0$

(3) $2y^2 + 27y + 13 = 0$

(4) $5m^2 = 22m + 15$

Practice Set 5

Solve the following quadratic equations by completing the square method.

(1) $x^2 + x - 20 = 0$

(2) $x^2 + 2x - 5 = 0$

(3) $m^2 - 5m = -3$

(4) $9y^2 - 12y + 2 = 0$

(5) $2y^2 + 9y + 10 = 0$

(6) $5x^2 = 4x + 7$

Practice Set 6

1. Compare the given quadratic equations to the general form and write values of a, b, c.

(1) $x^2 - 7x + 5 = 0$

(2) $2m^2 = 5m - 5$

(3) $y^2 = 7y$

2. Solve using formula.

(1) $x^2 + 6x + 5 = 0$

(2) $x^2 - 3x - 2 = 0$

(3) $3m^2 + 2m - 7 = 0$

(4) $5m^2 - 4m - 2 = 0$

(5) $5x^2 + 13x + 8 = 0$

Practice Set 7

1. Find the value of discriminant.

(1) $x^2 + 7x - 1 = 0$

(2) $2y^2 - 5y + 10 = 0$

2. Determine the nature of roots of the following quadratic equations.

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

(2) $2y^2 - 7y + 2 = 0$

(3) $m^2 + 2m + 9 = 0$

3. Form the quadratic equation from the roots given below.

(1) 0 and 4 (2) 3 and -10

4. Sum of the roots of a quadratic equation is double their product. Find k if equation is

$x^2 - 4kx + k + 3 = 0$

5. The roots of each of the following quadratic equations are real and equal, find k.

(1) $3y^2 + ky + 12 = 0$

(2) $kx(x - 2) + 6 = 0$

Practice Set 8

1. Product of Pragati's age 2 years ago and 3 years hence is 84. Find her present age.

2. The sum of squares of two consecutive natural numbers is 244; find the numbers.

3. Suyash scored 10 marks more in second test than that in the first. 5 times the score of the second test is the same as square of the score in the first test. Find his score in the first test.

4. Mr. Kasam runs a small business of making earthen pots. He makes certain number of pots on daily basis. Production cost of each pot is Rs 40 more than 10 times total number of pots, he makes in one day. If production cost of all pots per day is Rs 600, find production cost of one pot and number of pots he makes per day.
5. Pratik takes 8 hours to travel 36 km downstream and return to the same spot. The speed of boat in still water is 12 km. per hour. Find the speed of water current.
6. Pintu takes 6 days more than those of Nishu to complete certain work. If they work together they finish it in 4 days. How many days would it take to complete the work if they work alone.
7. If 460 is divided by a natural number, quotient is 6 more than five times the divisor and remainder is 1. Find quotient and divisor.

Practice Set 9

1. Which of the following sequences are A.P. ? If they are A.P. find the common difference .

(1) 2, 4, 6, 8, ... (2) -10, -6, -2, 2, ... (3) 0.3, 0.33, .0333, ... (4) 0, -4, -8, -12, ... (5) 127, 132, 137, ...

2. Write an A.P. whose first term is a and common difference is d in each of the following.

(1) $a = 10, d = 5$

(2) $a = -3, d = 0$

(3) $a = -1.25, d = 3$

(4) $a = 6, d = -3$

(5) $a = -19, d = -4$

3. Find the first term and common difference for each of the A.P.

(1) 5, 1, -3, -7, ... (2) 0.6, 0.9, 1.2, 1.5, ... (3) 127, 135, 143, 151, ...

Practice Set 10

1. Decide whether following sequence is an A.P., if so find the 20th term of the progression. -12, -5, 2, 9, 16, 23, 30, ...
2. Given Arithmetic Progression 12, 16, 20, 24, ... Find the 24th term of this progression.
3. Find the 19th term of the following A.P. 7, 13, 19, 25, ...
4. Find the 27th term of the following A.P. 9, 4, -1, -6, -11, ...
5. Find how many three digit natural numbers are divisible by 5.
6. The 11th term and the 21st term of an A.P. are 16 and 29 respectively, then find the 41th term of that A.P.
7. 11, 8, 5, 2, ... In this A.P. which term is number -151?
8. In the natural numbers from 10 to 250, how many are divisible by 4? 10. In an A.P. 17th term is 7 more than its 10th term. Find the common difference.

Practice Set 11

1. Find the sum of first 123 even natural numbers.
2. Find the sum of all even numbers from 1 to 350.
3. In an A.P. 19th term is 52 and 38th term is 128, find sum of first 56 terms.
4. Sum of first 55 terms in an A.P. is 3300, find its 28th term.
5. In an A.P. sum of three consecutive terms is 27 and their product is 504, find the terms. (Assume that three consecutive terms in A.P. are $a - d, a, a + d$.)
6. Find four consecutive terms in an A.P. whose sum is 12 and sum of 3rd and 4th term is 14. (Assume the four consecutive terms in A.P. are $a - d, a, a + d, a + 2d$.)
7. If the 9th term of an A.P. is zero then show that the 29th term is twice the 19th term.

Practice Set 12

1. On 1st Jan 2016, Sanika decides to save Rs 10, Rs 11 on second day, Rs 12 on third day. If she decides to save like this, then on 31st Dec 2016 what would be her total saving?

2. A man borrows ` 8000 and agrees to repay with a total interest of Rs 1360 in 12 monthly instalments. Each instalment being less than the preceding one by Rs 40. Find the amount of the first and last instalment.
3. Sachin invested in a national saving certificate scheme. In the first year he invested Rs 5000, in the second year Rs 7000, in the third year Rs 9000 and so on. Find the total amount that he invested in 12 years.
4. There is an auditorium with 27 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row and so on. Find the number of seats in the 15th row and also find how many total seats are there in the auditorium?
5. Kargil's temperature was recorded in a week from Monday to Saturday. All readings were in A.P. The sum of temperatures of Monday and Saturday was 5° C more than sum of temperatures of Tuesday and Saturday. If temperature of Wednesday was -30° celsius then find the temperature on the other five days.
6. On the world environment day tree plantation programme was arranged on a land which is triangular in shape. Trees are planted such that in the first row there is one tree, in the second row there are two trees, in the third row three trees and so on. Find the total number of trees in the 25 rows.

Practice Set 13

1. 'Pawan Medical' supplies medicines. On some medicines the rate of GST is 12%, then what is the rate of CGST and SGST?
2. On certain article if rate of CGST is 9% then what is the rate of SGST? and what is the rate of GST?
3. 'M/s. Real Paint' sold 2 tins of lustre paint and taxable value of each tin is Rs 2800. If the rate of GST is 28%, then find the amount of CGST and SGST charged in the tax invoice.
4. The taxable value of a wrist watch belt is Rs 586. Rate of GST is 18%. Then what is price of the belt for the customer ?
5. The total value (with GST) of a remote-controlled toy car is Rs 1770. Rate of GST is 18% on toys. Find the taxable value, CGST and SGST for this toy-car.
6. 'Tiptop Electronics' supplied an AC of 1.5 ton to a company. Cost of the AC supplied is Rs 51,200 (with GST). Rate of CGST on AC is 14%. Then find the following amounts as shown in the tax invoice of Tiptop Electronics.
 - (1) Rate of SGST
 - (2) Rate of GST on AC
 - (3) Taxable value of AC
 - (4) Total amount of GST
 - (5) Amount of CGST
 - (6) Amount of SGST
7. Prasad purchased a washing-machine from 'Maharashtra Electronic Goods'. The discount of 5% was given on the printed price of Rs 40,000. Rate of GST charged was 28%. Find the purchase price of washing machine. Also find the amount of CGST and SGST shown in the tax invoice.

Practice Set 14

1. 'Chetana Store' paid total GST of Rs 1,00,500 at the time of purchase and collected GST Rs 1,22,500 at the time of sale during 1st of July 2017 to 31st July 2017. Find the GST payable by Chetana Stores.
2. Nazama is a proprietor of a firm, registered under GST. She has paid GST of Rs 12,500 on purchase and collected Rs 14,750 on sale. What is the amount of ITC to be claimed ? What is the amount of GST payable ?
3. Amir Enterprise purchased chocolate sauce bottles and paid GST of Rs 3800. He sold those bottles to Akbari Bros. and collected GST of Rs 4100. Mayank Food Corner purchased these bottles from Akabari Bros and paid GST of Rs 4500. Find the amount of GST payable at every stage of trading and hence find payable CGST and SGST.
4. Malik Gas Agency (Chandigarh Union Territory) purchased some gas cylinders for industrial use for Rs 24,500, and sold them to the local customers for RS 26,500. Find the GST to be paid at the rate of 5% and hence the CGST and UTGST to be paid for this transaction. (for Union Territories there is UTGST instead of SGST.)
5. M/s Beauty Products paid 18% GST on cosmetics worth ` 6000 and sold to a customer for ` 10,000. What are the amounts of CGST and SGST shown in the tax invoice issued ?
6. Prepare Business to Consumer (B2C) tax invoice using given information. Write the name of the supplier, address, state, Date, invoice number, GSTIN etc. as per your choice. Supplier : M/s - - - - Address- - - - State - - - - Date - - - - -

Invoice No. ----- GSTIN ----- Particulars - Rate of Mobile Battery - Rs 200 Rate of GST 12% HSN 8507, 1 pc. Rate of Headphone – Rs 750 Rate of GST 18% HSN 8518, 1 pc.

(7) Prepare Business to Business (B2B) Tax Invoice as per the details given below. name of the supplier, address, Date etc. as per your choice. Supplier - Name, Address, State, GSTIN, Invoice No., Date Recipient - Name, Address, State, GSTIN, Items : (1) Pencil boxes 100, HSN - 3924, Rate – Rs 20, GST 12%
(2) Jigsaw Puzzles 50, HSN 9503, Rate –Rs 100 GST 12%.

Practice Set 15

- (1) Mr. Amol purchased 50 shares of Face Value Rs 100 when the Market value of the share was Rs 80. Company had given 20% dividend. Find the rate of return on investment.
- (2) Joseph purchased following shares, Find his total investment.
Company A : 200 shares, FV = Rs 2 Premium = Rs 18.
Company B : 45 shares, MV = Rs 500 Company C : 1 share, MV = Rs 10,540
- (4) Smt. Deshpande purchased shares of FV Rs 5 at a premium of Rs 20. How many shares will she get for Rs 20,000 ?
- (5) Shri Shantilal has purchased 150 shares of FV Rs 100, for MV of Rs 120. Company has paid dividend at 7%. Find the rate of return on his investment.
- (6) If the face value of both the shares is same, then which investment out of the following is more profitable ?
Company A : dividend 16%, MV = Rs 80, Company B : dividend 20%, MV = Rs 120.

Practice Set 16

1. Market value of a share is RS 200. If the brokerage rate is 0.3% then find the purchase value of the share.
2. A share is sold for the market value of Rs 1000. Brokerage is paid at the rate of 0.1%. What is the amount received after the sale ?
4. Smt. Desai sold shares of face value Rs 100 when the market value was Rs 50 and received Rs 4988.20. She paid brokerage 0.2% and GST on brokerage 18%, then how many shares did she sell ?
5. Mr. D'souza purchased 200 shares of FV Rs 50 at a premium of Rs 100. He received 50% dividend on the shares. After receiving the dividend he sold 100 shares at a discount of Rs 10 and remaining shares were sold at a premium of Rs 75. For each trade he paid the brokerage of Rs 20. Find whether Mr. D'souza gained or incurred a loss ? by how much ?

Practice Set 17

1. Write the correct alternative for the following questions.

- (1) If the Face Value of a share is Rs 100 and Market value is Rs 75, then which of the following statements is correct ?
(A) The share is at premium of Rs 175 (B) The share is at discount of Rs 25
(C) The share is at premium of Rs 25 (D) The share is at discount of Rs 75
- (2) What is the amount of dividend received per share of face value Rs 10 and dividend declared is 50%.
(A) Rs 50 (B) Rs 5 (C) Rs 500 (D) Rs 100
- (3) The NAV of a unit in mutual fund scheme is Rs 10.65 then find the amount required to buy 500 such units.
(A) 5325 (B) 5235 (C) 532500 (D) 53250
- (4) Rate of GST on brokerage is . . .
(A) 5% (B) 12% (C) 18% (D) 28%
- (5) To find the cost of one share at the time of buying the amount of Brokerage and GST is to be . . . the MV of share .
(A) added to (B) subtracted from (C) Multiplied with (D) divided by

2. Find the purchase price of a share of FV Rs 100 if it is at premium of Rs 30. The brokerage rate is 0.3%.

3. Prashant bought 50 shares of FV Rs 100, having MV RS 180. Company gave 40% dividend on the shares. Find the rate of return on investment.
4. Find the amount received when 300 shares of FV Rs 100, were sold at a discount of Rs 30.
5. Find the number of shares received when RS 60,000 was invested in the shares of FV Rs 100 and MV Rs 120.

6. Smt. Mita Agrawal invested Rs10,200 when MV of the share is RS 100. She sold 60 shares when the MV was Rs 125 and sold remaining shares when the MV was Rs 90. She paid 0.1% brokerage for each trading. Find whether she made profit or loss ? and how much ?
7. Market value of shares and dividend declared by the two companies is given below. Face Value is same and it is Rs 100 for both the shares. Investment in which company is more profitable ?
- (1) Company A –Rs 132 , 12%
 - (2) Company B – Rs 144, 16%
8. Shri. Aditya Sanghavi invested Rs 50,118 in shares of FV Rs 100, when the market value is Rs 50. Rate of brokerage is 0.2% and Rate of GST on brokerage is 18%, then How many shares were purchased for Rs 50,118 ?
9. Shri. Batliwala sold shares of ` 30,350 and purchased shares of RS 69,650 in a day. He paid brokerage at the rate of 0.1% on sale and purchase. 18% GST was charged on brokerage. Find his total expenditure on brokerage and tax.
10. Smt. Aruna Thakkar purchased 100 shares of FV 100 when the MV is Rs 1200. She paid brokerage at the rate of 0.3% and 18% GST on brokerage. Find the following –
- (1) Net amount paid for 100 shares.
 - (2) Brokerage paid on sum invested.
 - (3) GST paid on brokerage.
 - (4) Total amount paid for 100 shares.
11. Smt. Anagha Doshi purchased 22 shares of FV Rs 100 for Market Value of Rs 660. Find the sum invested. After taking 20% dividend, she sold all the shares when market value was Rs 650. She paid 0.1% brokerage for each trading done. Find the percent of profit or loss in the share trading. (Write your answer to the nearest integer.)

Practice Set – 18

1. How many possibilities are there in each of the following?

- (1) Vanita knows the following sites in Maharashtra. She is planning to visit one of them in her summer vacation. Ajintha, Mahabaleshwar, Lonar Sarovar, Tadoba wild life sanctuary, Amboli, Raigad, Matheran, Anandavan.
- (2) Any day of a week is to be selected randomly.
- (3) Select one card from the pack of 52 cards.
- (4) One number from 10 to 20 is written on each card. Select one card randomly.

Practice Set 19

(1) For each of the following experiments write sample space 'S' and number of sample points n(S).

- (1) One coin and one die are thrown simultaneously.
- (2) Two digit numbers are formed using digits 2, 3 and 5 without repeating a

2. Write sample space 'S' and number of sample point n(S) for each of the following experiments. Also write events A, B, C in the set form and write n(A), n(B), n(C).

- (1) One die is rolled,
Event A : Even number on the upper face.
Event B : Odd number on the upper face.
Event C : Prime number on the upper face.
- (2) Two dice are rolled simultaneously,
Event A : The sum of the digits on upper faces is a multiple of 6.
Event B : The sum of the digits on the upper faces is minimum 10.
Event C : The same digit on both the upper faces.
- (3) Three coins are tossed simultaneously. Condition for event A : To get at least two heads. Condition for event B : To get no head. Condition for event C : To get head on the second coin.

(4) Two digit numbers are formed using digits 0, 1, 2, 3, 4, 5 without repetition of the digits. Condition for event A : The number formed is even Condition for event B : The number formed is divisible by 3. Condition for event C : The number formed is greater than 50.

(5) From three men and two women, environment committee of two persons is to be formed. Condition for event A : There must be at least one woman member. Condition for event B : One man, one woman committee to be formed. Condition for event C : There should not be a woman member.

(6) One coin and one die are thrown simultaneously. Condition for event A : To get head and an odd number. Condition for event B : To get a head or tail and an even number. Condition for event C : Number on the upper face is greater than 7 and tail on the coin.

Practice Set 20

1. If two coins are tossed, find the probability of the following events.

(1) Getting at least one head.

(2) Getting no head.

2. If two dice are rolled simultaneously, find the probability of the following events.

(1) The sum of the digits on the upper faces is at least 10.

(2) The sum of the digits on the upper faces is 33.

(3) The digit on the first die is greater than the digit on second die.

3. There are 15 tickets in a box, each bearing one of the numbers from 1 to 15. One ticket is drawn at random from the box. Find the probability of event that the ticket drawn –

(1) shows an even number.

(2) shows a number which is a multiple of 5.

4. A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability that the number formed is

(1) an odd number ?

(2) a multiple of 5 ?

5. A card is drawn at random from a pack of well shuffled 52 playing cards. Find the probability that the card drawn is -

(1) an ace.

(2) a spade.

Practice Set 21

1. The following table shows classification of number of workers and the number of hours they work in a software company. Find the median of the number of hours they work.

Daily No. of hours	8 – 10	10-12	12-14	14-16
Number of workers	150	500	300	50

2. The frequency distribution table shows the number of mango trees in a grove and their yield of mangoes. Find the median of data.

No. of Mangoes	50-100	100-150	150-200	200-250	250-300
No. of trees	33	30	90	80	17

3. The following table shows the classification of number of vehicles and their speeds on Mumbai-Pune express way. Find the median of the data.

Average Speed of Vehicles(Km/hr)	60-64	64-69	70-74	75-79	79-84	84-89
No. of vehicles	10	34	55	85	10	6

4. The production of electric bulbs in different factories is shown in the following table. Find the median of the productions.

No. of bulbs produced (Thousands)	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of factories	12	35	20	15	8	7	8

Practice Set 22

1. The following table shows the information regarding the milk collected from farmers on a milk collection centre and the content of fat in the milk, measured by a lactometer. Find the mode of fat content.

Content of fat (%)	2-3	3-4	4-5	5-6	6-7
Milk collected (Litre)	30	70	80	60	20

2. Electricity used by some families is shown in the following table. Find the mode for use of electricity.

Use of electricity (Unit)	0-20	20-40	40-60	60-80	80-100	100-120
No. of families	13	50	70	100	80	17

3. Grouped frequency distribution of supply of milk to hotels and the number of hotels is given in the following table. Find the mode of the supply of milk.

Milk (Litre)	1-3	3-5	5-7	7-9	9-11	11-13
No. of hotels	7	5	15	20	35	18

4. The following frequency distribution table gives the ages of 200 patients treated in a hospital in a week. Find the mode of ages of the patients.

Age (years)	Less than 5	5-9	10-14	15-19	20-24	25-29
No. of patients	38	32	50	36	24	20

Practice Set 23

1. Draw a histogram of the following data.

Height of student (cm)	135-140	140-145	145-150	150-155
No. of students	4	12	16	8

2. The table below shows the yield of jowar per acre. Show the data by histogram.

Yield per acre (quintal)	2-3	4-5	6-7	8-9	10-11
No. of farmers	30	50	55	40	20

3. In the following table, the investment made by 210 families is shown. Present it in the form of a histogram.

Investment (Thousand Rupees)	10-15	15-20	20-25	25-30	30-35
No. of families	30	50	60	55	15

4. Time allotted for the preparation of an examination by some students is shown in the table. Draw a histogram to show the information.

Time (minutes)	60-80	80-100	100-200	120-140	140-160
No. of students	14	20	24	22	16