



ASSIGNMENT

Subject: Mathematics

Class: IX

OCTOBER 2026

Chapter- Predicting What Comes Next: Exploring Sequences and Progressions

Q1) Find four numbers forming a GP in which the third term is greater than the first by 9, and the second term is greater than the fourth by 18.

Q2) A fractal tree has an initial branch length of 50 cm. Each successive branch is half the length of the previous branch. What will be the length of the 6th branch?

Q3) Find 12th term of the GP: $\frac{1}{x^3a^3}, ax, a^5x^5$

Q4) **Case Study:**

A scientist observes the growth of a bacterial culture in a laboratory. Initially, there are 200 bacteria in a sample. Under favourable conditions, the number of bacteria becomes three times its previous count every hour. The scientist records the number of bacteria at regular intervals to study the pattern of growth.

Based on the information given above, answer the following questions.

(i) Write the number of bacteria present initially and after 1 hour.

(ii) Identify the common ratio of the sequence formed by the number of bacteria at each hourly interval.

- (iii) How many bacteria will be present after 4 hours?
- (iv) If the number of bacteria at a particular hour is 48,600, determine the number of bacteria present one hour before that.
- (v) Which term of the GP represents 16,200 bacteria?

Q5) Case Study:

A student drops a ball from a height of 128 cm onto a hard floor. After each bounce, the ball rises to $\frac{2}{5}$ of the height from which it fell immediately before that bounce. The student records the maximum height reached by the ball after each bounce to study the pattern formed by the successive heights.

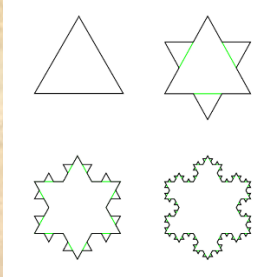
Based on the information given above, answer the following questions.

- (i) Write the heights reached by the ball after the first four bounces.
- (ii) Find the common ratio of the GP formed by these heights.
- (iii) What maximum height will the ball reach after the 6th bounce?
- (iv) After which bounce will the ball reach a maximum height of $\frac{256}{125}$ cm?
- (v) After which bounce will the ball reach a maximum height of $\frac{64}{625}$ cm?

Q6) Insert two numbers between 4 and 108 so that the resulting sequence forms a GP with a positive common ratio.

Q7) Find the value of x if 4, x, 36 are three consecutive terms of a GP.

Q8) In the construction of a Koch curve, each line segment is replaced by four smaller segments, each of length one-third of the original segment.



(a) If the initial segment has length 81 cm, find the length of each segment after two iterations.

(b) Write the common ratio of the GP formed by the lengths of corresponding segments across successive iterations.

Q9) The 2nd term of a GP is 12, and the 5th term is 324. Find the n th term.

Q10) Plot the points corresponding to the GP 64,32,16,8,... What do you observe about the graph as the term number increases?

Chapter- Two Variables, One Line

Q1) Find the value of k for which the following pair of linear equations have infinitely many solutions: $2x + 3y = 7$, $(k + 1)x + (2k - 1)y = 4k + 1$

Q2) Find the relation between p and q if $x = 3$ and $y = 1$ is the solution of the pair of equations $x - 4y + p = 0$ and $2x + y - q - 2 = 0$.

Q3) A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it

becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

Q4) In a two-digit number, the ten's digit number is three times the unit's digit. When the number is decreased by 54, the digits are reversed. Find the number.

Q5) Draw the graph of $2x + y = 6$ and $2x - y + 2 = 0$. Shade the region bounded by these lines and x-axis. Find the area of the shaded region.

Q6) A man travel 370 km partly by train and partly by car. If he covers 250 km by train and the rest by car, it takes him 4 hours. But, if he travels 130 km by train and the rest by car, he takes 18 minutes longer. Find the speed of the train and that of the car.

Q7) The taxi charges in a city comprise of a fixed charges together with charge for the distance covered. For a journey of 10 km, the charges paid is ₹75 and for a journey of 15 km, the charges paid is ₹110. What will a person have to pay for travelling a distance of 25 km?

Q8) A bag contains some red and blue balls. Ten percent of the red balls, when added to twenty percent of the blue balls, give a total of 24. If three times the number of red balls exceeds the number of blue balls by 20, find the number of red and blue balls.

Q9) Two numbers are in the ratio 5:6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Find the numbers.

Q10) There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B. But if 20 students are sent from B to A, the number of students in A becomes double

the number of students in B. Find the number of students in the two halls.

Q11) A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first-class ticket from the station A to B costs Rs 2530. Also, one reserved first-class ticket and one reserved first-class half ticket from A to B costs Rs 3810. Find the full first-class fare from station A to B, and also the reservation charges for a ticket.