

PRACTICE PAPER 06 (2026-27)
CHAPTER 02 INTRODUCTION TO LINEAR POLYNOMIALS

SUBJECT: MATHEMATICS

MAX. MARKS : 40

CLASS : IX

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A company manufactures water purifiers. The production cost consists of a fixed setup cost of ₹25,000 and ₹1,800 per purifier.
Which expression represents the total production cost of x purifiers?
(a) $25000x + 1800$ (b) $1800x + 25000$ (c) $26800x$ (d) $25000 + 1800$
2. The graph of a linear polynomial passes through $(0, -6)$ and $(5, 14)$.
Its slope is:
(a) 2 (b) 3 (c) 4 (d) 5
3. A sequence follows the pattern: 15, 22, 29, 36, ...
The 15th term is:
(a) 106 (b) 108 (c) 113 (d) 120
4. A tank initially contains 5000 litres of water and loses 180 litres every day.
The amount of water after d days is:
(a) $5000+180d$ (b) $180d-5000$ (c) $5000-180d$ (d) $5180d$
5. The value of $p(x) = 11x - 7$ when $x = 5$ is:
(a) 48 (b) 50 (c) 52 (d) 55
6. A school bus travels 32 km every day. The total distance covered after n days is:
(a) $32 + n$ (b) $32n$ (c) $n + 32$ (d) $64n$
7. The y-intercept of $y = -8x + 15$ is:
(a) -8 (b) 8 (c) 15 (d) -15
8. The monthly electricity bill consists of a fixed charge of ₹200 and ₹8 per unit consumed.
Which expression represents the bill for x units?
(a) $8x + 200$ (b) $200x + 8$ (c) $208x$ (d) $200 + 8$

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

9. **Assertion (A):** The graph of $y = 7x - 11$ cuts the y-axis at $(0, -11)$.

Reason (R): For $x = 0$, the value of y equals the constant term.

10. **Assertion (A):** The lines $y = 4x + 7$ and $y = 4x - 13$ are parallel.

Reason (R): Lines having equal slopes are parallel.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A school science exhibition charges ₹25 per visitor and a fixed registration charge of ₹120.

The total collection from x visitors is represented by: $C = 25x + 120$

Find: (i) The total collection when 32 visitors attend.

(ii) How much additional collection is obtained if the number of visitors increases from 32 to 40?

12. The length of a rectangular park is represented by $(3x + 4)$ m and its breadth is $(x + 6)$ m

If the length is 25 m, find:

(i) The value of x .

(ii) The breadth of the park.

13. A mobile recharge company charges a fixed maintenance fee and ₹15 per GB of data.

The monthly bill is represented by: $B = 15x + 75$

Find: (i) Bill for 20 GB data.

(ii) Bill for 35 GB data.

(iii) Increase in bill from 20 GB to 35 GB.

14. The n th term of a sequence is: $12n - 7$.

Find: (i) 15th term

(ii) 25th term

(iii) Difference between the two terms.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A taxi service charges a fixed booking amount and ₹22 per kilometre travelled.

A passenger travels 18 km and pays ₹500.

Find: (i) The fixed booking charge.

(ii) The linear equation representing the total fare.

(iii) The fare for travelling 30 km.

16. The graph of a linear relationship passes through the points $(2, 8)$ and $(7, 23)$

Find: (i) The slope of the graph.

(ii) The equation of the line.

(iii) The value of y when $x = 15$.

17. Draw the graph of the equation $x - y = 3$. If $y = 3$, then find the value of x from the graph.

SECTION – D

Questions 18 carry 5 marks each.

18. A smart parking system charges a fixed entry fee and ₹35 per hour of parking.

A customer parked a vehicle for 12 hours and paid ₹500.

Find: (i) The fixed entry fee.

(ii) The linear equation representing the parking charge.

- (iii) The parking charge for 20 hours.
- (iv) The parking duration corresponding to a bill of ₹920.
- (v) Explain why the relationship between parking hours and parking charges is linear.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: Solar Energy for a School Campus

As part of a school reading competition, Meera selected a book containing 720 pages. She decided to read 35 pages every day and maintain a consistent reading schedule. The school librarian recorded her progress and encouraged students to use mathematics to predict the remaining pages after a given number of days. The activity helped students understand linear decay and the practical use of linear polynomials in daily life. By observing the pattern, students were able to estimate how long it would take to finish the book and how many pages would remain at different stages of the challenge.



- (a) Write the linear equation representing the number of pages left after d days.
- (b) Find the number of pages left after 12 days.
- (c) Determine after how many days only 20 pages will remain unread.
- (d) State whether the situation represents linear growth or linear decay.

20. Case Study 2: Solar Energy for a School Campus

Green Future Solutions was invited to install solar panels on the rooftop of a senior secondary school. The company charges a fixed consultation and installation fee, along with ₹1,250 for each solar panel installed. During the first phase, the school installed 8 panels and received a bill of ₹12,000. Encouraged by the reduction in electricity costs, the school management planned to install more panels in the next phase. The principal asked students to analyse the billing pattern using linear polynomials so that they could predict future expenses and understand how mathematics is used in sustainable development projects.



- (a) Determine the fixed consultation and installation fee charged by the company. (1)
 - (b) Write the linear equation representing the total cost for installing x panels. (1)
 - (c) Calculate the total bill if the school installs 15 solar panels. (1)
 - (d) Find the number of solar panels that can be installed if the total budget is ₹25,750. (1)
-

PRACTICE PAPER 06 (2026-27)
CHAPTER 02 INTRODUCTION TO LINEAR POLYNOMIALS
(ANSWERS)

SUBJECT: MATHEMATICS

MAX. MARKS : 40

CLASS : IX

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. A company manufactures water purifiers. The production cost consists of a fixed setup cost of ₹25,000 and ₹1,800 per purifier.
Which expression represents the total production cost of x purifiers?
(a) $25000x + 1800$ (b) $1800x + 25000$ (c) $26800x$ (d) $25000 + 1800$
Ans: (b) $1800x + 25000$
Fixed cost = ₹25,000
Variable cost = ₹1,800 per purifier
Therefore, $C = 1800x + 25000$
2. The graph of a linear polynomial passes through (0, -6) and (5, 14).
Its slope is:
(a) 2 (b) 3 (c) 4 (d) 5
Ans: (c) 4
$$m = \frac{14 - (-6)}{5 - 0}$$
$$= \frac{20}{5}$$
$$= 4$$
3. A sequence follows the pattern: 15, 22, 29, 36, ...
The 15th term is:
(a) 106 (b) 108 (c) 113 (d) 120
Ans: (c) 113
Common increase = 7
 $T_n = 15 + (n - 1) \times 7$
 $T_{15} = 15 + 14(7) = 15 + 98 = 113$
4. A tank initially contains 5000 litres of water and loses 180 litres every day.
The amount of water after d days is:
(a) $5000+180d$ (b) $180d-5000$ (c) $5000-180d$ (d) $5180d$
Ans: (c) $5000-180d$
5. The value of $p(x) = 11x - 7$ when $x = 5$ is:
(a) 48 (b) 50 (c) 52 (d) 55
Ans: (a) 48

$$p(5) = 11(5) - 7 = 55 - 7 = 48$$

6. A school bus travels 32 km every day. The total distance covered after n days is:
 (a) $32 + n$ (b) $32n$ (c) $n + 32$ (d) $64n$

Ans: (b) $32n$

7. The y-intercept of $y = -8x + 15$ is:
 (a) -8 (b) 8 (c) 15 (d) -15

Ans: (c) 15

8. The monthly electricity bill consists of a fixed charge of ₹200 and ₹8 per unit consumed. Which expression represents the bill for x units?

(a) $8x + 200$ (b) $200x + 8$ (c) $208x$ (d) $200 + 8$

Ans: (a) $8x + 200$

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

9. **Assertion (A):** The graph of $y = 7x - 11$ cuts the y-axis at $(0, -11)$.

Reason (R): For $x = 0$, the value of y equals the constant term.

Ans: (a) Both A and R are true and R is the correct explanation.

10. **Assertion (A):** The lines $y = 4x + 7$ and $y = 4x - 13$ are parallel.

Reason (R): Lines having equal slopes are parallel.

Ans: (a) Both A and R are true and R is the correct explanation.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A school science exhibition charges ₹25 per visitor and a fixed registration charge of ₹120. The total collection from x visitors is represented by: $C = 25x + 120$

Find: (i) The total collection when 32 visitors attend.

(ii) How much additional collection is obtained if the number of visitors increases from 32 to 40?

Ans: Given, $C = 25x + 120$

For 32 visitors,

$$C = 25(32) + 120 = 800 + 120 = 920$$

Therefore, collection = ₹920

Now for 40 visitors,

$$C = 25(40) + 120 = 1000 + 120 = 1120$$

$$\text{Additional collection} = 1120 - 920 = 200$$

12. The length of a rectangular park is represented by $(3x + 4)$ m and its breadth is $(x + 6)$ m. If the length is 25 m, find:

(i) The value of x .

(ii) The breadth of the park.

Ans: Given, $3x + 4 = 25$

Subtracting 4 from both sides, we get $3x = 21$

$$\Rightarrow x = 7$$

$$\text{Now breadth: } x + 6 = 7 + 6 = 13$$

13. A mobile recharge company charges a fixed maintenance fee and ₹15 per GB of data.
The monthly bill is represented by: $B = 15x + 75$

Find: (i) Bill for 20 GB data.

(ii) Bill for 35 GB data.

(iii) Increase in bill from 20 GB to 35 GB.

Ans: For 20 GB,

$$B = 15(20) + 75 = 300 + 75 = 375$$

For 35 GB,

$$B = 15(35) + 75 = 525 + 75 = 600$$

$$\text{Increase} = 600 - 375 = 225$$

14. The n th term of a sequence is: $12n - 7$

Find: (i) 15th term

(ii) 25th term

(iii) Difference between the two terms.

Ans: For 15th term,

$$T_{15} = 12(15) - 7 = 180 - 7 = 173$$

For 25th term,

$$T_{25} = 12(25) - 7 = 300 - 7 = 293$$

$$\text{Difference} = 293 - 173 = 120$$

SECTION - C

Questions 15 to 17 carry 3 marks each.

15. A taxi service charges a fixed booking amount and ₹22 per kilometre travelled.

A passenger travels 18 km and pays ₹500.

Find: (i) The fixed booking charge.

(ii) The linear equation representing the total fare.

(iii) The fare for travelling 30 km.

Ans: Let the fixed booking charge be ₹ b .

$$\text{Total fare: } y = 22x + b$$

$$\text{Given, } 500 = 22(18) + b = 396 + b$$

$$\Rightarrow b = 104$$

Therefore, Fixed booking charge = ₹104

$$\text{Linear equation: } y = 22x + 104$$

For 30 km,

$$y = 22(30) + 104 = 660 + 104 = 764$$

16. The graph of a linear relationship passes through the points (2, 8) and (7, 23)

Find: (i) The slope of the graph.

(ii) The equation of the line.

(iii) The value of y when $x = 15$.

Ans: Slope:

$$m = \frac{23 - 8}{7 - 2}$$

$$= \frac{15}{5}$$

$$= 3$$

$$\text{Equation: } y = 3x + b$$

Using point (2,8),

$$8 = 3(2) + b$$

$$\Rightarrow 8 = 6 + b \Rightarrow b = 2$$

Therefore, $y = 3x + 2$

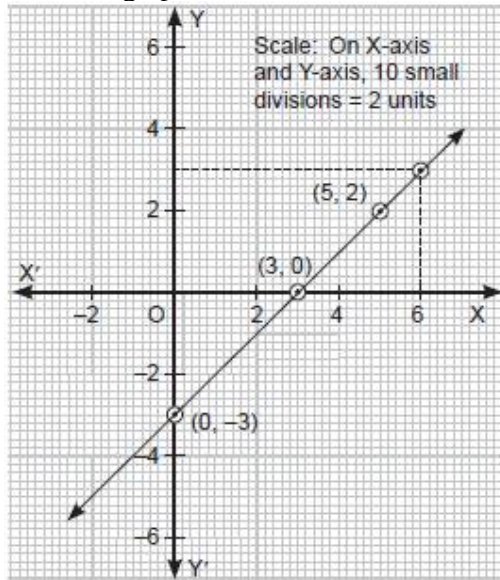
When $x = 15$ then $y = 3(15) + 2 = 45 + 2 = 47$

17. Draw the graph of the equation $x - y = 3$. If $y = 3$, then find the value of x from the graph.

Ans. $x - y = 3$

x	0	3	5
y	-3	0	2

From the graph, we can see that the value of x is 6 for $y = 3$.



SECTION - D

Questions 18 carry 5 marks each.

18. A smart parking system charges a fixed entry fee and ₹35 per hour of parking. A customer parked a vehicle for 12 hours and paid ₹500. Find: (i) The fixed entry fee.
(ii) The linear equation representing the parking charge.
(iii) The parking charge for 20 hours.
(iv) The parking duration corresponding to a bill of ₹920.
(v) Explain why the relationship between parking hours and parking charges is linear.

Ans: Let fixed fee = ₹ b

$$y = 35x + b$$

Given, $500 = 35(12) + b = 420 + b$

$$\Rightarrow b = 80$$

Fixed fee = ₹80

Equation: $y = 35x + 80$

For 20 hours,

$$y = 35(20) + 80 = 700 + 80 = 780$$

For ₹920,

$$35x + 80 = 920$$

$$\Rightarrow 35x = 840$$

$$\Rightarrow x = 24$$

Since the charge increases by a constant amount of ₹35 for every additional hour, the relationship is linear.

SECTION - E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study 1: Solar Energy for a School Campus

As part of a school reading competition, Meera selected a book containing 720 pages. She decided to read 35 pages every day and maintain a consistent reading schedule. The school librarian recorded her progress and encouraged students to use mathematics to predict the remaining pages after a given number of days. The activity helped students understand linear decay and the practical use of linear polynomials in daily life. By observing the pattern, students were able to estimate how long it would take to finish the book and how many pages would remain at different stages of the challenge.



- (a) Write the linear equation representing the number of pages left after d days.
- (b) Find the number of pages left after 12 days.
- (c) Determine after how many days only 20 pages will remain unread.
- (d) State whether the situation represents linear growth or linear decay.

Ans: Initial number of pages = 720

Pages read daily = 35

Therefore, $P = 720 - 35d$

(a) Equation: $P = 720 - 35d$

(b) For 12 days,

$$P = 720 - 35(12)$$

$$= 720 - 420$$

$$= 300$$

Pages remaining = 300

(c) When 20 pages remain,

$$720 - 35d = 20$$

$$\Rightarrow 35d = 700$$

$$\Rightarrow d = 20$$

(d) The number of pages decreases uniformly every day.

Hence, it represents linear decay.

20. Case Study 2: Solar Energy for a School Campus

Green Future Solutions was invited to install solar panels on the rooftop of a senior secondary school. The company charges a fixed consultation and installation fee, along with ₹1,250 for each solar panel installed. During the first phase, the school installed 8 panels and received a bill of ₹12,000. Encouraged by the reduction in electricity costs, the school management planned to install more panels in the next phase. The principal asked students to analyse the billing pattern using linear polynomials so that they could predict future expenses and understand how mathematics is used in sustainable development projects.



- (a) Determine the fixed consultation and installation fee charged by the company. (1)
 (b) Write the linear equation representing the total cost for installing x panels. (1)
 (c) Calculate the total bill if the school installs 15 solar panels. (1)
 (d) Find the number of solar panels that can be installed if the total budget is ₹25,750. (1)

Ans: (a) Let the fixed fee be ₹ b .

Cost of each panel = ₹1,250.

Total cost: $y = 1250x + b$

Given: $12000 = 1250(8) + b = 10000 + b$

$\Rightarrow b = 2000$

Thus, fixed fee = ₹2,000.

(b) Equation: $y = 1250x + 2000$

(c) For 15 panels:

$y = 1250(15) + 2000 = 18750 + 2000 = 20750$

(d) For budget ₹25,750:

$1250x + 2000 = 25750$

$\Rightarrow 1250x = 23750$

$\Rightarrow x = 19$

.....