



Class 9 Maths Chapter 2 – Exercise 2.3

Introduction to Linear Polynomials

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Exercise 2.3 focuses on **linear patterns** and how to represent real-life situations using linear expressions. It contains **5 questions** involving savings, decreasing quantities, area, volume and pages read.

Question 1 – Savings Pattern

A student has ₹500 in her savings bank account and gets ₹150 every month as pocket money. Find the amount from the second month onwards and a linear expression for the amount in the n th month.

Solution

Initial amount = ₹500

Monthly pocket money = ₹150

Month	Amount
2	₹800
3	₹950
4	₹1100
5	₹1250

For n months:

$$\text{Amount} = 500 + 150n$$

 Answer:

Linear expression: $A = 500 + 150n$

Question 2 – Rally Members

A rally starts with **120 members**. Every hour, **9 members drop out**. Find the number remaining after 1, 2, 3, ... hours and write a linear expression for the n th hour.

Solution

Hour	Members remaining
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1	$120 - 9 = 111$
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2	$120 - 18 = 102$
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3	$120 - 27 = 93$
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After n hours, members dropped out = $9n$.

Therefore:

$$\text{Members remaining} = 120 - 9n$$

 **Answer:**

Linear expression: $M = 120 - 9n$

Question 3 – Area of a Rectangle

The length of a rectangle is **13 cm**. Find its area when the breadth is:

(i) **12 cm**

$$\text{Area} = 13 \times 12$$

$$= 156 \text{ cm}^2$$

(ii) **10 cm**

$$\text{Area} = 13 \times 10$$

$$= 130 \text{ cm}^2$$

(iii) 8 cm

$$\text{Area} = 13 \times 8$$

$$= 104 \text{ cm}^2$$

Therefore, the areas form the pattern:

156, 130, 104, ...

If breadth = b cm:

$$\text{Area} = \text{Length} \times \text{Breadth}$$

$$A = 13b$$

✓ **Answer:**

- (i) 156 cm^2
 - (ii) 130 cm^2
 - (iii) 104 cm^2
 - Linear expression: $A = 13b$
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Question 4 – Volume of a Rectangular Box

The length of a rectangular box is **7 cm** and breadth is **11 cm**. Find its volume when the height is:

(i) 5 cm

$$V = 7 \times 11 \times 5$$

$$= 385 \text{ cm}^3$$

(ii) 9 cm

$$V = 7 \times 11 \times 9$$

$$= 693 \text{ cm}^3$$

(iii) 13 cm

$$V = 7 \times 11 \times 13$$

$$= 1001 \text{ cm}^3$$

If height = h cm:

$$V = 7 \times 11 \times h$$

$$V = 77h$$

✓ **Answer:**

- (i) 385 cm^3
 - (ii) 693 cm^3
 - (iii) 1001 cm^3
 - Linear expression: $V = 77h$
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Question 5 – Reading a Book

Sarita is reading a book of **500 pages**. She reads **20 pages every day**.

(i) How many pages are left after 15 days?

Pages read:

$$20 \times 15 = 300$$

Pages left:

$$500 - 300 = 200$$

✓ **Answer:**

200 pages

(ii) Express the situation as a linear pattern.

Let the number of days be n .

Pages read in n days:

$$20n$$

Therefore:

$$\text{Pages left} = 500 - 20n$$

✓ **Answer:**

$$P = 500 - 20n$$



Exercise 2.3 – Quick Answer Key

Question	Final Answer
n	
1	$A = 500 + 150n$
2	$M = 120 - 9n$
3(i)	156 cm^2
3(ii)	130 cm^2
3(iii)	104 cm^2
3	$A = 13b$
4(i)	385 cm^3
4(ii)	693 cm^3
4(iii)	1001 cm^3
4	$V = 77h$
5	200 pages after 15 days
5	$P = 500 - 20n$



Key Concept

A **linear pattern** is formed when a quantity changes by the **same fixed amount** at every step.

Examples from this exercise:

- Increasing: $500 + 150n$
- Decreasing: $120 - 9n$
- Area: $13b$
- Volume: $77h$
- Pages remaining: $500 - 20n$

These expressions show how a real-life situation can be represented using a **linear expression**.