NEET

2027

Introduction to Linear Polynomials

Lecture-5

CLASS-9TH | MATHS

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Topics To Be Covered

1. Linear growth and Linear Decay

Introduction to Linear Polynomials

Lecture – 5

QUESTIONS

WHICH PATTERN IS **LINEAR**?

- 2, 4, 6, 8, 10
- 5, 10, 15, 20, 25
- 1, 4, 9, 16, 25
- 100, 90, 80, 70, 60
- 3, 6, 12, 24, 48

QUESTIONS

Find the: 25th term of: 3, 5, 7, 9, ...

Rule : $2n+1$

25^{th} term $= 2(25)+1$

$= 51$

QUESTIONS

Write the rule: 7, 10, 13, 16, ...

98^{th} term =

$3(98)+4 = 298$

$3n+4$

Rule ki help se
aap direct koi
bhi term nikal sakte ho!

QUESTIONS

A water tank contains: 800 litres of water.

Every minute: 25 litres are drained.

Find:

- Water left after: 10 minutes → 800-25(10) → 550l
- Expression for: n minutes → 800-25n

Rule:

T	water left
0	800
1	800-25
2	800-25-25
3	800-25(3)
4	800-25(4)

If Expression for 't' minutes.
800-25t

QUESTIONS

#GPH

Suppose the length of a rectangular box is 7 cm and breadth is 11 cm. Find the volume if the height is (i) 5 cm, (i) 9 cm, (ii) 13 cm. Find the linear pattern representing the volume of the rectangular box.

$l = 7\text{cm}$

$b = 11\text{cm}$

linear

Pattern $(V) = 77h$

(i) $V = l \times b \times h$

$= 7 \times 11 \times 5$

$= 77(5)\ \text{cm}^3$

(ii) $V = lbh$

$= 7 \times 11 \times 9$

$= 77(9)\ \text{cm}^3$

(iii) $V = 77(13)\ \text{cm}^3$

QUESTIONS

Identify: Growth, Decay or Neither?

- Instagram followers: 100 → 150 → 200 → 250 G
- Phone battery: 100 → 90 → 80 → 70 D
- Village population: 500 → 550 → 600 → 650 G
- Water in tank: 1000 → 850 → 700 → 550 D
- Bank balance: 2000 → 2200 → 2400 → 2600 G

LINEAR GROWTH

A quantity shows linear growth when it increases by the same amount in equal intervals.

Examples:

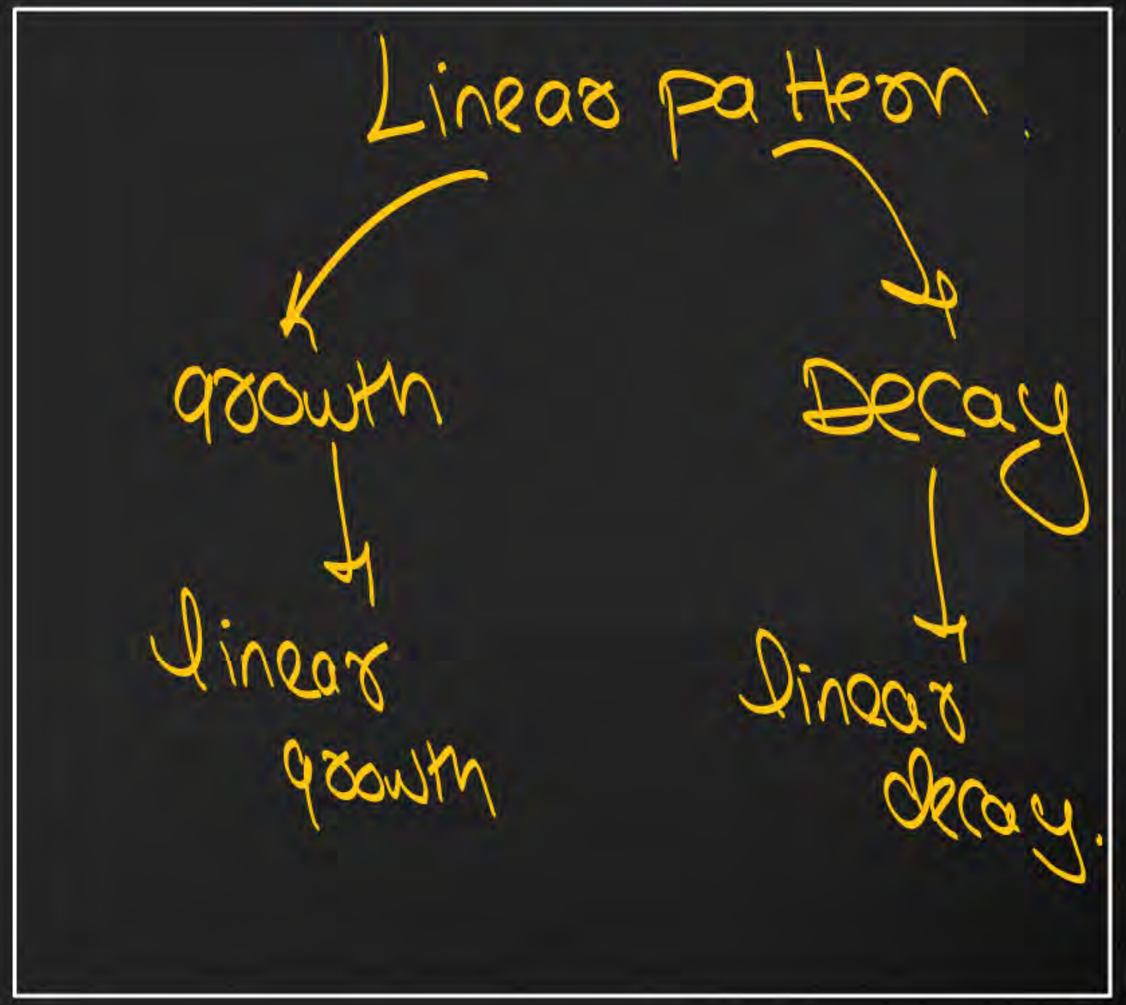
- 100, 120, 140, 160, 180
- 500, 550, 600, 650, 700
- 1000, 1100, 1200, 1300, 1400

LINEAR DECAY

A quantity shows linear decay when it decreases by the same amount in equal intervals.

Examples:

- 100, 95, 90, 85, 80
- 500, 450, 400, 350, 300
- 1000, 900, 800, 700, 600



QUESTIONS

A plant has height 1.75 feet.

It grows by 0.5 feet every month.

Questions:

1. Height after 7 months?

$1.75+7(0.5)$

5.25 feet

2. Expression for height after t months?

time (in months)	Plant height (in feet)
0	1.75
1	2.25 $(1.75+0.5)$
2	2.75 $(1.75+0.5(2))$
3	$1.75+3(0.5)$
4	$1.75+4(0.5)$

Plant height $= 1.75+t(0.5)$

$= 1.75+0.5t$ //

QUESTIONS

A YouTube channel starts with 500 subscribers.

Every week it gains 75 subscribers.

Questions:

1. Subscribers after 10 weeks?

$500 + 75(10)$

$= \boxed{1250}$

2. Expression after w weeks?

$\text{Subs} = \boxed{500 + 75w}$

t (in weeks)	Subs.
	500
0	
1	500+75
2	500+75(2)
3	500+75(3)
4	500+75(4)

QUESTIONS

A game character starts with 1000 health points.

Every minute loses 25 points.

Questions:

1. Health after 20 minutes? $1000 - 20(25) = 500$

2. Expression after m minutes? $1000 - 25m$

QUESTIONS

A mobile phone is bought for 10,000. Its value decreases by 800 every year.

(i) Find the value of the phone after 3 years. $10000 - 3(800) = 7600$ Rs

(ii) Make a table of values for t varying from 0 to 8 years and show how the value of the phone, v, depreciates with time.

(iii) Find an expression that relates v and t, and explain why it represents linear decay.

(ii)

t (in years)	V
0	10000
1	9200
2	8400
3	7600
4	6800
5	6000
6	5200
7	4400
8	3600

(iii) Value of phone (v) $= 10000 - 800t$

$V = 10000 - 800t$

QUESTIONS

The initial population of a village is 750. Every year, 50 people move from a nearby city to the village.

(i) Find the population of the village after 6 years. $750+6(50)=1050$

(ii) Make a table of values for t varying from 0 to 10 years and show how the population, P, increases every year.

(iii) Find an expression that relates P and t, and explain why it represents linear growth.

(ii)

t (in years)	P
0	750
1	800
2	850
3	900
4	950
5	1000
6	1050
7	1100
8	1150
9	1200
10	1250

(iii) $P=750+50t$

Years (t)	Population (P)
0	750
1	800
2	850
3	900
4	950
5	1000
6	1050
7	1100
8	1150
9	1200
10	1250

Answer to Part (iii)

$$P = 750 + 50t$$

It represents **linear growth** because the population increases by a constant amount of **50 people every year**.

4. A telecom company charges ₹600 for a certain recharge scheme. This prepaid balance is reduced by ₹15 each day after the recharge.

(i) Write an equation that models the remaining balance $b(x)$ after using the scheme for x days. Explain why it represents linear decay.

(ii) After how many days will the balance run out?

(iii) Make a table of values for x varying from 1 to 10 days and show how the balance $b(x)$, reduces with time.

(i) $b(x) = 600 - 15x$

(ii) $600 - 15x = 0$

$600 = 15x$

$40 = x$

(i) Equation for the remaining balance

Initial balance = ₹600

Balance decreases by ₹15 every day

$$b(x) = 600 - 15x$$

where:

- $b(x)$ = remaining balance after x days
- x = number of days

Since the balance decreases by the same amount (₹15) every day, it represents **linear decay**.

(ii) After how many days will the balance run out?

Balance becomes 0 when:

$$600 - 15x = 0$$

$$15x = 600$$

$$x = 40$$

$$40 \text{ days}$$

(iii) Table of Values

Days (x)	Balance b(x) (₹)
0	600
1	585
2	570
3	555
4	540
5	525
6	510
7	495
8	480
9	465
10	450

Thank You !

- *Work Hard.*
- *Dream big.*
- *Never give up.*