# UDAAN

2026

## Pair of Linear Equation in Two Variables

MATHS LECTURE-7

BY-RITIK SIR

# Topics *to be covered*

A Word Problems Part-3

# RITIK SIR

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#GAPU

#Q. A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹1500 after 4 year of service and ₹1800 after 10 years of service, what was his starting salary and what is the annual increment?

Let Starting Salary be 'x'
and annual increment be 'y'.

$x + 4y = 1500$

$x + 10y = 1800$

$-6y = -300$

$y = 50$

$x + 4y = 1500$

$x + 4(50) = 1500$

$x + 200 = 1500$

$x = 1300$

Ans: ∴ Starting Salary = 1300 Rs

annual inc. = 50 Rs

#Q. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of two cars?

CBSE 2009

Let, the speeds of two cars be $x$ and $y$.

Case-I

$D = S \times T$


$S = x$

$D = AD$

$T = 5$

$AD = x \times 5$

$S = y$

$D = BD$

$T = 5$

$BD = y \times 5$

$AB + BD = AD$

$100 + 5y = 5x$ ①

Case-II


$S = x$

$D = AC$

$T = 1$

$AC = x \times 1$

$S = y$

$D = BC$

$T = 1$

$BC = y \times 1$

$AC + CB = AB$

$x + y = 100$ ②

$-5x + 5y = -100$

$5x + 5y = 500$

add

$10y = 400$

$y = 40$

From (2)

$x + y = 100$

$x + 40 = 100$

$x = 60$

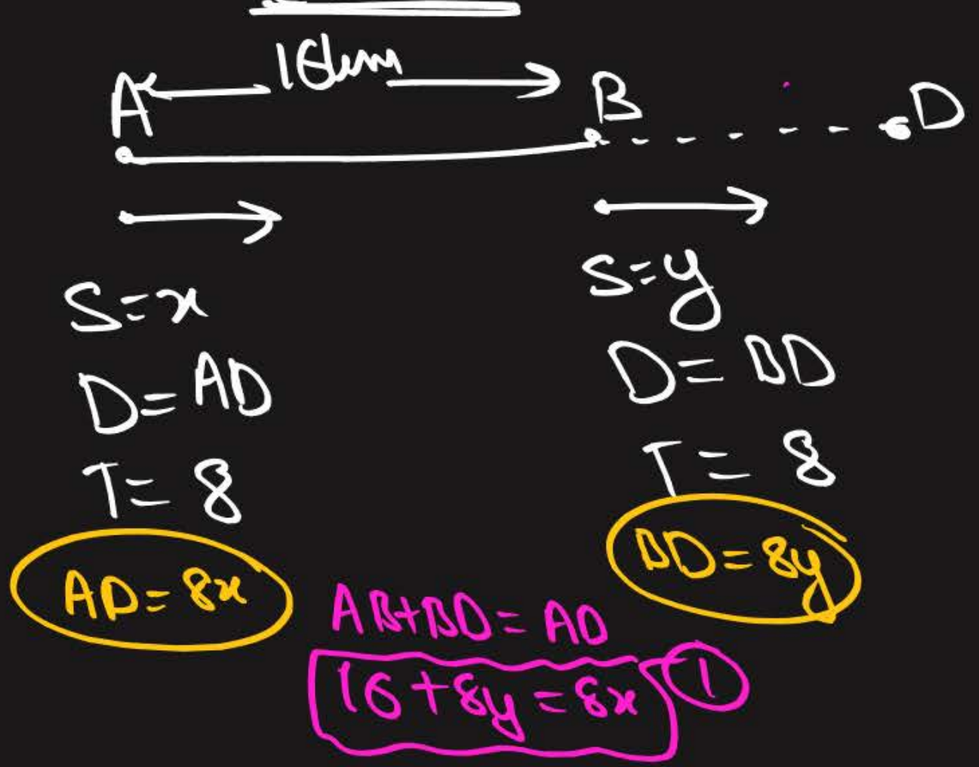
$\therefore$ the speeds of cars are 60km/h and 40km/h.

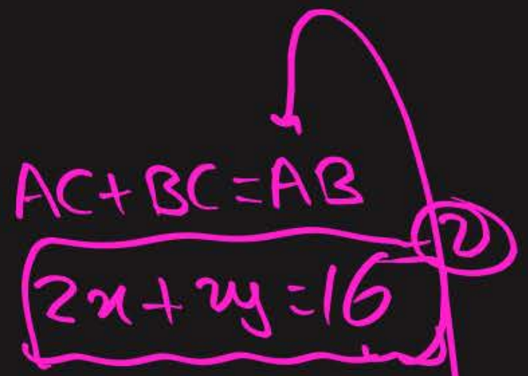
#S²BD

#Q. Two people are 16 km apart on a straight road. They start walking at the same time. If they walk towards each other with different speeds, they will meet in 2 hours. Had they walked in the same direction with same speeds as before, they would have met in 8 hours. Find their walking speeds.

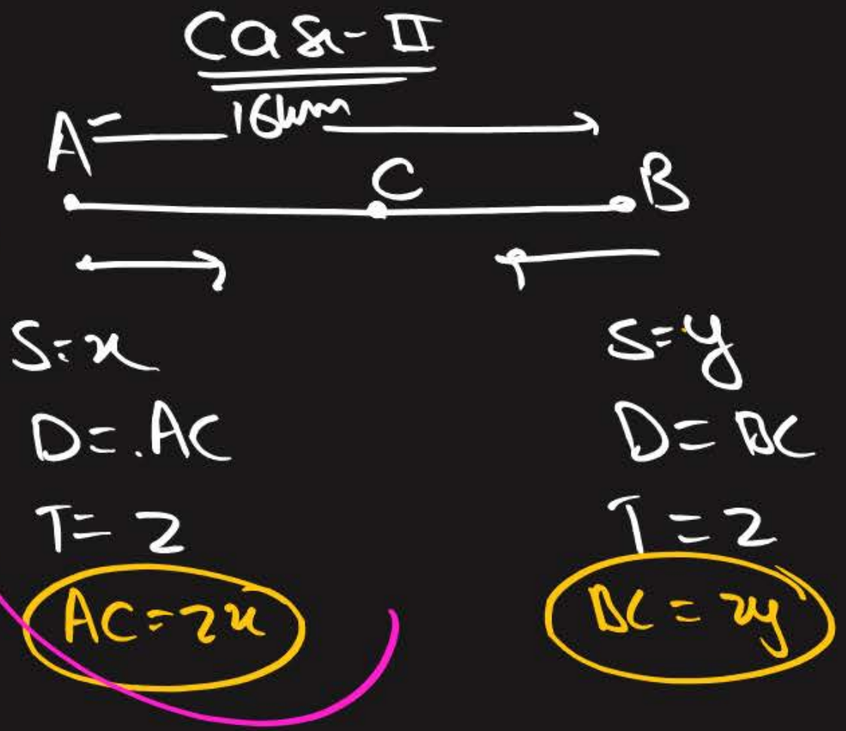
CBSE 2023

Case-I



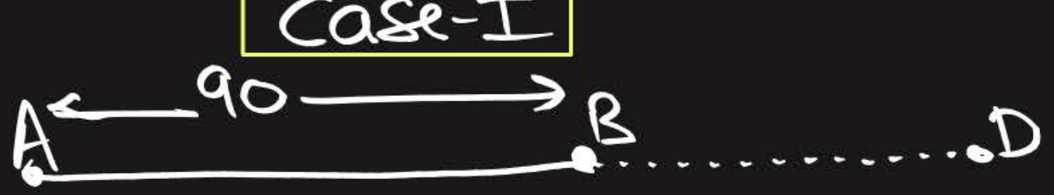




Case-II



#Q. Points A and B are 90 km apart from each other on a highway. A car starts from A and another from B at the same time. If they go in the same direction they meet in 9 hours and if they go in opposite directions they meet in 9/7 hours. Find their speeds.

Case-I




S = x
D = AD
T = 9

AD = 9x

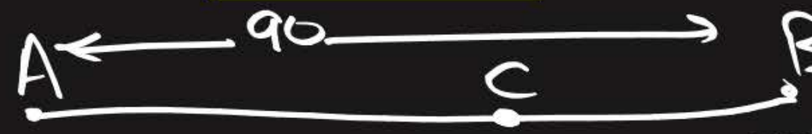
S = y
D = BD
T = 9

BD = 9y

AB + BD = AD

$90 + 9y = 9x$ ... (1)

Case-II




S = x
D = AC
$T = \frac{9}{7}$

$AC = \frac{9}{7}x$

S = y
D = BC
$T = \frac{9}{7}$

$BC = \frac{9}{7}y$

AC + BC = AB

$\frac{9}{7}x + \frac{9}{7}y = 90$ ... (2)

# Taxi charges

Fixed charge

$x$

depends on distance.

1 km = $y$

21 km

$x + 21y$

35 km

$x + 35y$

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

CBSE 2000

Let, charge per km = 'y' Rs

Fixed charge = 'x' Rs

For 1 km.

$x + 10y = 75$ ... (1)

For 15 km

$x + 15y = 110$

$x + 10y = 75$

$x + 15y = 110$

$-5y = -35$

$y = 7$

$x + 10(7) = 75$

$x + 70 = 75$

$x = 5$

∴ For 25 km

$= x + 24y$

$= 5 + 24(7)$

$= 5 + 168$

$= 173$ Rs

#Q. The car hire charges in a city comprise of a fixed charges together with the charge for the distance covered. For a journey of 12 km, the charge paid is 89 and for a journey of 20 km, the charge paid is 145. What will a person have to pay for travelling a distance of 30 km?

$x + 12y = 89$

$x + 20y = 145$

CBSE 2000

#Q. A part of monthly hostel charges in a college are fixed and the remaining depend on the number of days one has taken food in the mess. When a student A takes food for 20 days, he has to pay ₹1000 as hostel charges whereas a student B, who takes food for 26 days, pays ₹1180 as hostel charges. Find the fixed charge and the cost of food per day.

x

y

CBSE 2000

For 20 days,

$x + 20y = 1000$ — (1)

For 26 days,

$x + 26y = 1180$ — (2)

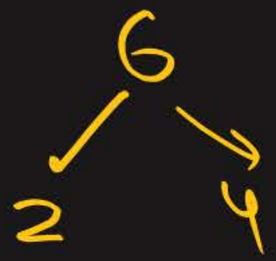
Ans: 400 Rs, 30 Rs

#Q. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days, and an additional charge for each day thereafter. Latika paid ₹22 for a book kept for 6 days while Anand paid ₹16 for the book kept for four days. Find the fixed charges and charge for each extra day.

Let, Fixed charge for First two days = $x$

, addition charge thereafter = $y$

Latika (6 days) → 22 RS




$x + 4y = 22$

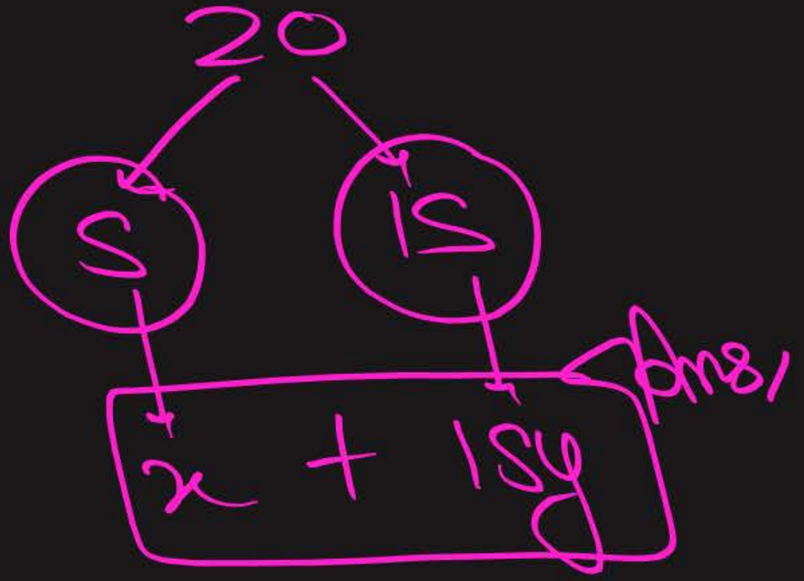
Anand (4 days) → 16 RS


$x + 2y = 16$

Fixed charge → 5 days → x

additional charge after days → y

For 20 days ?



#Q. The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them.

Let, supplementary angles be $x$ and $y$. $(x > y)$

$$x - y = 18$$
$$x + y = 180$$

Ans: 99, 81

CBSE 2019

Supplementary angles
↓
2 angles → sum = 180

Complementary angles
↓
2 angles → sum = 90

For each right answer = +4

For each wrong answer = -2

no. of right answers = $x$

no. of wrong answers = $y$

total marks = $4x-2y$

For each right answer = +4

For each wrong answer = -1

no. of right answers = $x$

no. of wrong answers = $y$

total marks = $4x-y$

#Q. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?

For each right answer = +3

For each wrong answer = -1

total marks = 40

Let, no. of right answers = x

no. of wrong answers = y

total Questions = x + y

For each right answer = +4

For each wrong answer = -2

total marks = 50

$3x - y = 40$

$4x - 2y = 50$

$6x - 2y = 80$

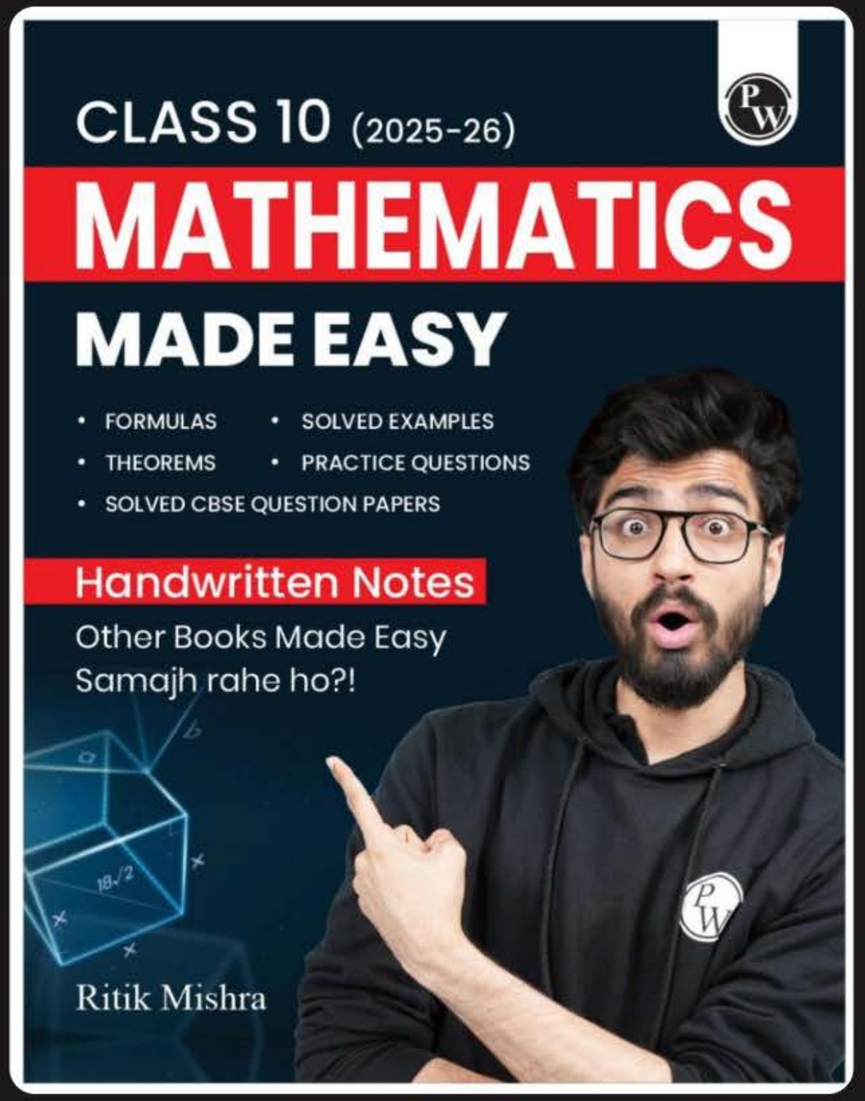
$4x - 2y = 50$

$2x = 30$

$x = 15$

$y = 5$

#Q. In a competitive examination, one mark is awarded for each correct answer while 1/2 mark is deducted for every wrong answer. Jayanti answered 120 questions and got 90 marks. How many questions did she answer correctly.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