



# UDAAN



2026

## Quadratic Equations

MATHS

LECTURE-8

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# Topics

*to be covered*

**A**

Word Problems Part-**3**

Total cost = no of things  $\times$  cost of one thing.

#Q. If the list price of a toy is reduced by ₹ 2, a person can buy 2 toys more for ₹ 360. Find the original price of the toy.

Let no. of toys =  $x$ .

Let cost of each toy =  $y$ .

I

$\therefore$  Total cost =  $xy$

$$360 = xy \quad \boxed{1}$$

II

no. of toys =  $x+2$

cost of each toy =  $y-2$

Total cost =  $(x+2)(y-2)$

$$360 = (x+2)(y-2) \quad \text{CBSE 2002}$$

$$360 = xy - 2x + 2y - 4$$

$$\cancel{360} = \cancel{360} - 2x + 2y - 4$$

$$2x - 2y = -4$$

$$x - y = -2 \quad \boxed{2}$$

$$x - \frac{360}{x} = -2$$

Ans. ₹ 20

#Q. A shopkeeper buys a number of books for ₹80. If he had bought 4 more books for the same amount, each book would have cost ₹1 less. how many books did he buy?

Case I Let no. of books =  $x$

cost of each book =  $y$

$$T.C = xy$$

$$80 = xy \quad (1)$$

$$86 = xy - x + 4y - 4 \quad \text{CBSE 2012}$$

$$x - 4y = -4 \quad (2)$$

$$x - 4\left(\frac{80}{x}\right) = -4$$

Case II

no. of books =  $x+4$

cost of each book =  $y-1$

$$T.C = (x+4)(y-1)$$

#Q. ₹ 9000 were divided equally among a certain number of persons. Had there been 20 more persons, each would have got ₹ 160 less. Find the original number of persons.

Case I no. of persons =  $x$

each gets =  $y$

Total =  $xy$

$$9000 = xy$$

~~$9000 = xy - 160x + 20y - 3200$~~

$$160x - 20y = -3200$$

$$8x - y = -160 \quad \text{②}$$

Case II

no. of persons =  $x+20$

each gets =  $y-160$

Total =  $(x+20)(y-160)$

#Q. At  $t$  minutes past 2 pm the time needed by the minutes hand and a clock to show 3 pm was found to be 3 minutes less than  $t^2/4$  minutes. Find  $t$ .

~~HSPU~~

**NCERT EXAMPLER**

**Ans. 14 minutes**

#Q. Two water taps together can fill a tank in  $1\frac{7}{8}$  hours. The tap with longer diameter takes 2 hours less than the tap with the smaller one to fill the tank separately. Find the time in which each tap can fill the tank separately.

Let, tap with smaller diameter fill the tank in  $x \text{ hrs}$

$\therefore$  " " larger diameter " " " " " =  $x - 2 \text{ hrs}$

**CBSE 2019, 23**

L.D

1 unit =  $x - 2 \text{ hrs}$

1 unit =  $1 \text{ hrs}$

S.D

1 unit =  $x \text{ hrs}$

1 unit =  $1 \text{ hrs}$

$\frac{15}{8x} \text{ u} = \frac{15}{8} \text{ hrs}$

$\frac{15}{8(x-2)} \text{ u} = \frac{15}{8} \text{ hrs}$

Ans. 3 hr, 5 hr

$$\frac{15}{8(x-2)} + \frac{15}{8x} = 2$$

$$\frac{15}{8} \left[ \frac{1}{x-2} + \frac{1}{x} \right] = 2$$

$$\boxed{\frac{1}{x-2} + \frac{1}{x} = \frac{8}{15}}$$

$1 \text{ unit} = x^1 \text{ hrs}$

$\frac{1}{x} \text{ unit} = 1^1 \text{ hrs}$

$\frac{15}{8}x \text{ unit} = \frac{15}{8} \text{ hrs}$

$1 \text{ unit} = x-2^1 \text{ hrs}$

$\frac{1}{x-2} \text{ unit} = 1^1 \text{ hrs}$

$\frac{15}{8}(x-2) \text{ unit} = \frac{15}{8} \text{ hrs}$

$$\frac{15}{8}x + \frac{15}{8}(x-2) = 1$$

#Q. To fill a swimming pool two pipes are used. If the pipe of larger diameter used for 4 hours and the pipe of smaller diameter for 9 hours, only half of the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool?

Diagram of a swimming pool with a pipe at the top. The pipe is shown filling the pool.

$$\text{Time for larger pipe} = x + 10 \text{ hrs}$$

$$\text{Time for smaller pipe} = x \text{ hrs}$$

$$\frac{1}{x+10} \text{ unit} = 1 \text{ hr}$$

$$\frac{1}{x} \text{ unit} = 1 \text{ hr}$$

$$\frac{9}{x+10} \text{ unit} = 9 \text{ hrs}$$

$$\frac{9}{x+10} + \frac{9}{x} = \frac{1}{2}$$

Diagram of a swimming pool with a pipe at the top. The pipe is shown filling the pool.

$$\text{Time for larger pipe} = x \text{ hrs}$$

$$\text{Time for smaller pipe} = x + 10 \text{ hrs}$$

$$\frac{1}{x} \text{ unit} = 1 \text{ hr}$$

$$\frac{1}{x+10} \text{ unit} = 1 \text{ hr}$$

$$\frac{9}{x} \text{ unit} = 9 \text{ hrs}$$

**CBSE 2015**

**Ans. 20 hr, 30 hr**

#Q. A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together can finish it in 4 days, find the time taken by B to finish the work.

$$\begin{array}{l} \text{A,} \\ \text{'x-6'} \end{array}$$

$$\text{'1 unit}' = \text{'x-6' days}$$

$$\frac{1}{x-6} \text{ unit} = \text{'1 day}$$

$$\frac{4}{x-6} \text{ unit} = \text{'4 day}$$

$$\begin{array}{l} \text{B,} \\ \text{'x'} \end{array}$$

$$\text{'1 unit}' = \text{'x days}$$

$$\frac{1}{x} \text{ unit} = \text{'1 day}$$

$$\frac{4}{x} \text{ unit} = \text{'4 day}$$

$$\text{A+B}$$

days

**CBSE 2017**

$$\frac{4}{x-6} + \frac{4}{x} = 1$$

$$4 \left[ \frac{1}{x-6} + \frac{1}{x} \right] = 1$$

$$\frac{x+x-6}{(x-6)(x)} = \frac{1}{4}$$

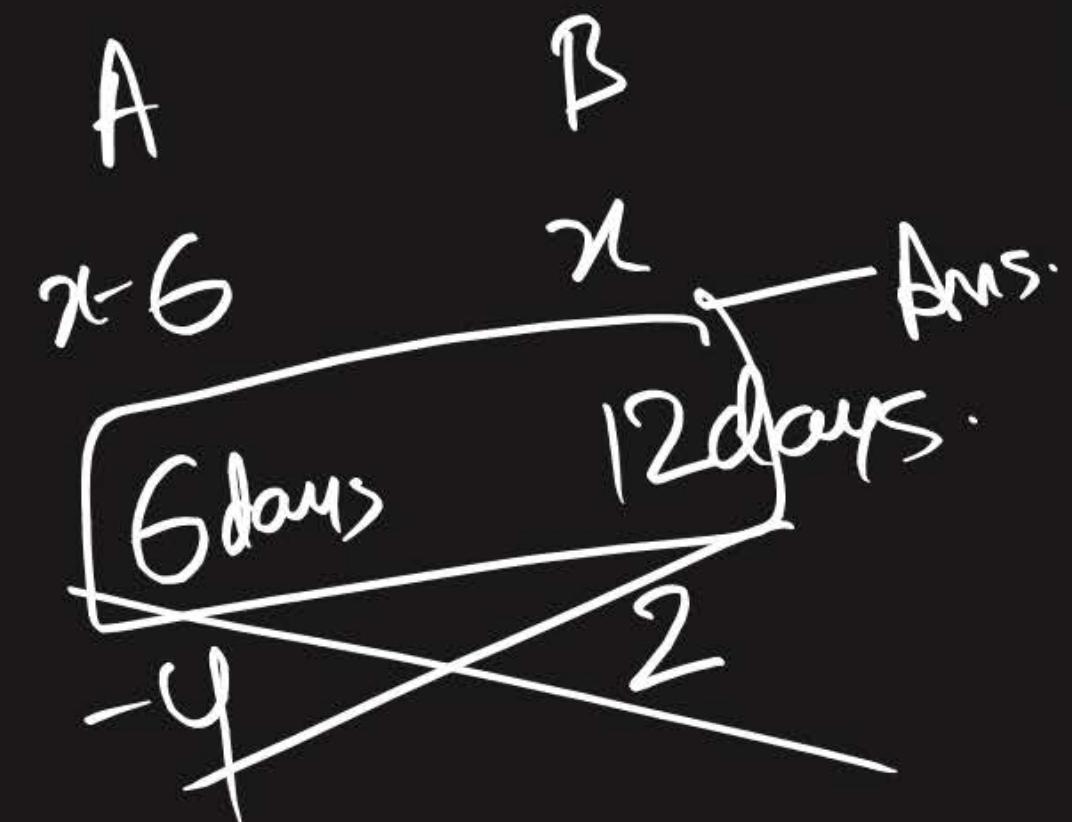
$$\frac{2x-6}{x^2-6x} = \frac{1}{4}$$

$$8x-24 = x^2 - 6x$$

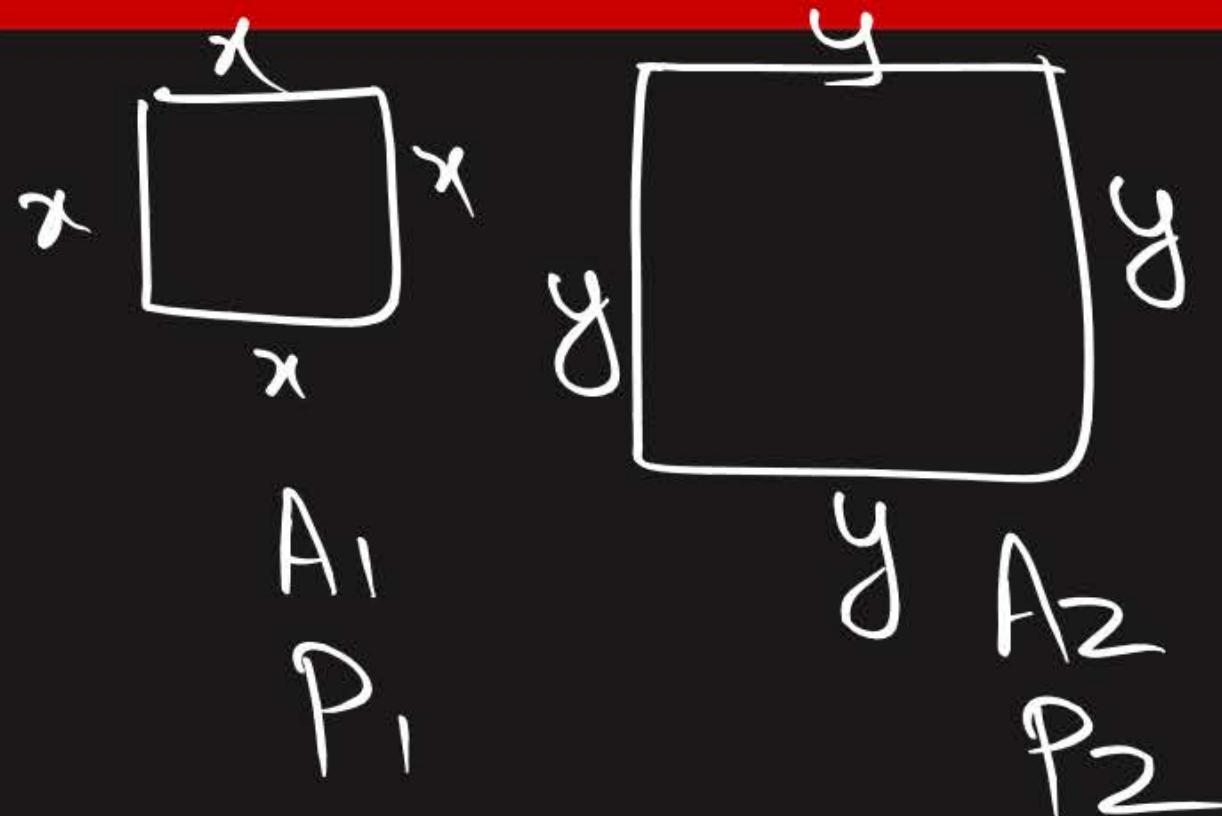
$$0 = x^2 - 14x + 24$$

$$-12, -2$$

$$x=12, 2$$



#Q. Sum of the areas of two squares is  $640 \text{ m}^2$ . if the difference of their perimeters is  $64 \text{ m}$ , find the sides of the two squares.



$$A_1 + A_2 = 640$$

$$x^2 + y^2 = 640$$

**CBSE 2008, 13**

$$P_2 - P_1 = 64$$

$$4y - 4x = 64$$

$$y - x = 16 \quad \textcircled{2}$$

$$y = 16 + x$$

**Ans. 24m, 8m**

$$x^2 + y^2 = 640$$

$$x^2 + (y+16)^2 = 640$$

$$x^2 + x^2 + 256 + 32x = 640$$

$$2x^2 + 32x - 384 = 0$$

$$x^2 + 16x - 192 = 0$$

Sum = 16, product = -192

$$24, -8$$

$$\begin{array}{r} \underline{-8} \\ \underline{24} \\ \hline 16 \end{array}$$

$$x = -24, 8$$

$$x = 8$$

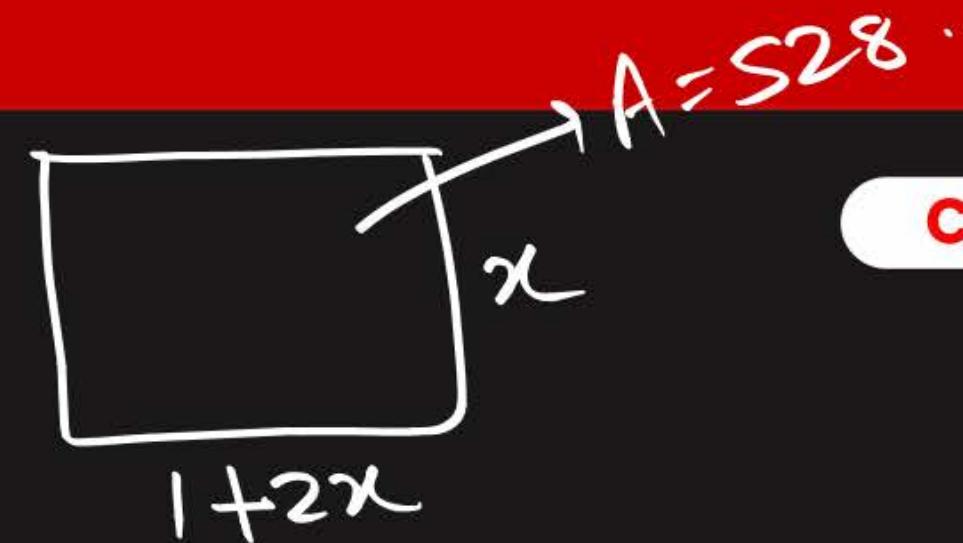
$$y = 16 + x$$

$$y = 24$$

#Q. The area of a rectangular plot is  $528 \text{ m}^2$ . The length of the plot (in meters) is one metre more than twice its breadth. Find the length and the breadth of the plot.



$$\begin{aligned} A &= lb \\ 528 &= lb \quad (1) \\ l &= 1 + 2b \quad (2) \end{aligned}$$

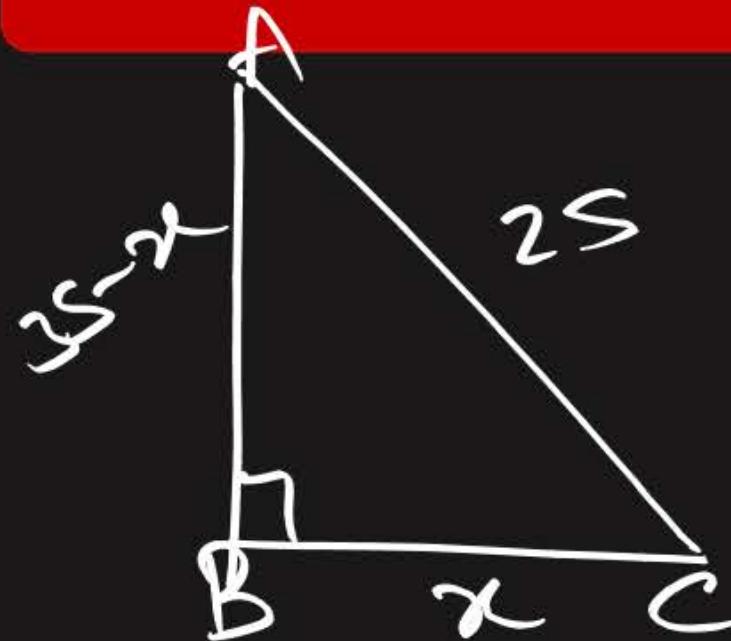


$$\begin{aligned} A &= lb \\ 528 &= (l + 2x)x \end{aligned}$$

CBSE 2014

Ans. 33m, 16m

#Q. The perimeter of a right triangle is 60 cm. Its hypotenuse is 25 cm. Find the area of the triangle.



$$P = AB + BC + AC$$

$$60 = AB + x + 25$$

$$35 - x = AB$$

P.G.T

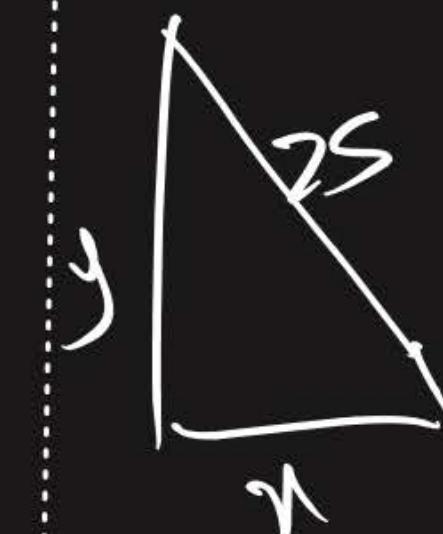
$$(25)^2 = (x)^2 + (35-x)^2$$

$$A = \frac{1}{2} \times \text{base} \times \text{height}$$

$$A = \frac{1}{2} \times BC \times AB$$

M.II

CBSE 2016

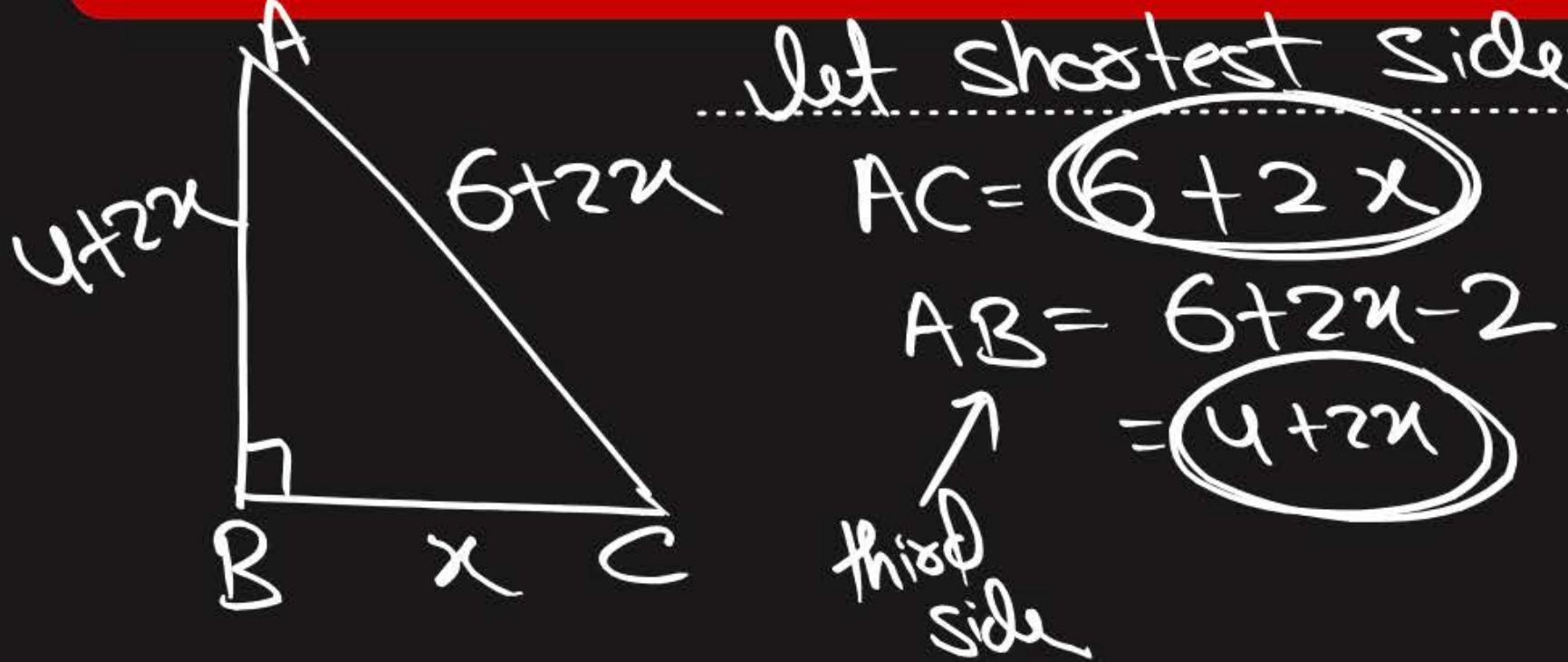


$$x + y + 25 = 60$$

$$x^2 + y^2 = 25$$

Ans.  $150\text{cm}^2$

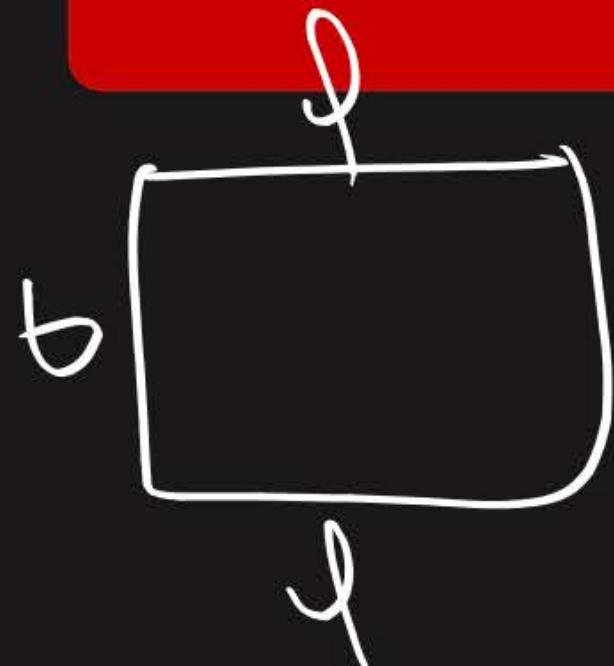
#Q. The hypotenuse of right-angled triangle is 6 metres more than twice the shortest side. If the third side is 2 metres less than the hypotenuse, find the sides of the triangle.



Ans. 10m, 26m and 24m

#Q. Is it possible to design a rectangular park of perimeter 80 m and area 400 m<sup>2</sup>?

If so, find its length and breadth.



$$P = 80$$

$$\begin{aligned} 2l + 2b &= 80 \\ l + b &= 40 \end{aligned}$$

$$A = 400$$

$$lb = 400$$

$$b = 40 - l$$

$$l(40 - l) = 400$$

$$40l - l^2 = 400$$

$$0 = l^2 - 40l + 400$$

$$D = l^2 - 4ac$$

$$\begin{aligned} D &= (40)^2 - 4(1)(400) \\ &= 1600 - 1600 = 0 \end{aligned}$$

**NCERT**

Yes, it is possible

Nature

real and equal.

Ans. Yes, 20m, 20m



CLASS 10 (2025-26)



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Samajh rahe ho?!



Ritik Mishra



2026  
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Chapter-wise & Topic-wise  
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## CLASS 10

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STANDARD

Ritik Mishra

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# Truth 😭

**What she puts in her stomach**



**What she puts on her skin**



211K



665



**WORK HARD  
DREAM BIG  
NEVER GIVE UP**



# RITIK SIR

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