a. **Create an Algebraic Expression**

Let:

- x = number of chairs
- y = number of tables

The cost for renting chairs is 2$ per chair and the cost of renting tables is 10$ per table. Therefore, the total cost C can be expressed as:

$C=2x+10y$

b. Budget Constraint

You have a budget of $500, so the budget constraint can be written as:

$2x+10y\leq 500$

c. Problem Solving

If you decide to rent 20 tables, substitute y=20 into the budget constraint:

$2x+10(20)\leq 500$

This simplifies to:

$2x+200\leq 500$
Subtracting 200 from both sides:

$2x\leq 300$
Dividing by 2: we get,

$x\leq 150$
So, if you rent 20 tables, you can rent a maximum of 150 chairs.

Maximum Number of Chairs When No Tables Are Rented

If no tables are rented (y=0), the budget constraint becomes:

$2x+10(0) \leq 500$
This simplifies to:

$2x \leq 500$
Dividing by 2:

$x \leq 250$
So, if you decide not to rent any tables, you can rent a maximum of 250 chairs.

d. Maximization

To determine the maximum number of chairs you can rent if you decide not to rent any tables (i.e., y=0y = 0y=0), substitute y=0y = 0y=0 into the budget constraint:

$2x+10(0) \leq 500$

This simplifies to:

$2x \leq 500$

Now, divide by 2:

$x \leq 250x$

So, you can rent at most 250 chairs if you do not rent any tables.

e. Graphical Representation