



12 Heuristic

Making a Supposition

- 1 There were a total of 30 cars and motorcycles at a car park. There were 100 wheels in all. How many cars were there at the car park?

Method 1: Make a List

No. of cars	No. of wheels	No. of motorcycles	No. of wheels	Total no. of wheels

Method 2: Make an Assumption (Assume either all were cars or all were motorcycles.)

- 2 Each adult movie ticket costs \$8. Each child movie ticket costs \$5. Sean buys 10 movie tickets altogether. He pays \$74 in all. Find the number of adult movie tickets and the number of child movie tickets Sean buys.

Method 1: Make a List

No. of adult tickets	Value	No. of child tickets	Value	Total value

Method 2: Make an Assumption (Assume either all were adult tickets or all were child tickets.)

Making a Supposition

1. *Method 1: Make a List*

Start with half the total for each vehicle.

No. of cars	No. of wheels	No. of motorcycles	No. of wheels	Total no. of wheels
15	60	15	30	90

The total number of wheels should be 100.

$$100 - 90 = 10 \quad (\text{difference in total number of wheels})$$

$$4 - 2 = 2 \quad (\text{difference in the number of wheels between the two vehicles})$$

$$10 \div 2 = 5 \quad (\text{add 5 cars and subtract 5 motorcycles to the first guess})$$

No. of cars	No. of wheels	No. of motorcycles	No. of wheels	Total no. of wheels
20	80	10	20	100

There were **20** cars at the car park.

Method 2: Make an Assumption

If all were motorcycles,

$$30 \times 2 = 60$$

there would be 60 wheels.

$$100 - 60 = 40$$

There is a difference of 40 wheels.

$$4 - 2 = 2$$

The difference in the number of wheels between a car and a motorcycle is 2.

$$40 \div 2 = 20$$

There were **20** cars at the car park.

2. *Method 1: Make a List*

Start with half the total for each type of tickets.

No. of adult tickets	Value	No. of child tickets	Value	Total value
5	\$40	5	\$25	\$65

The total cost of all the movie tickets should be \$74.

$$\$74 - \$65 = \$9 \quad (\text{difference in total cost of the movie tickets})$$

$$\$8 - \$5 = \$3 \quad (\text{difference between the adult and child movie tickets})$$

$$\$9 \div \$3 = 3 \quad (\text{add 3 adult movie tickets and subtract 3 child movie tickets to the first guess})$$

No. of adult tickets	Value	No. of child tickets	Value	Total value
8	\$64	2	\$10	\$74

He bought **8** adult tickets and **2** child tickets.

Method 2: Make an Assumption

If all were adult tickets, $10 \times \$8 = \80

he would have spent \$80.

$$\$80 - \$74 = \$6$$

There is a difference of \$6.

The difference between the cost of 1 adult and 1 child ticket is \$3.

$$\$6 \div \$3 = 2$$

He bought **2** child tickets and **8** adult tickets.