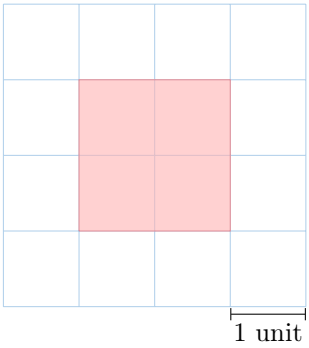
PERIMETER

A DEFINITION

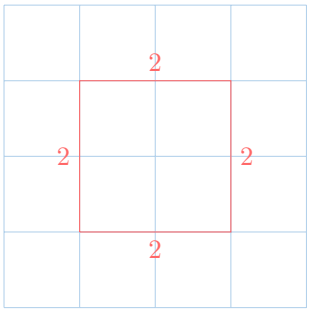
A.1 FINDING PERIMETER OF A SHAPE

Ex 1: What is the perimeter of the shaded figure?



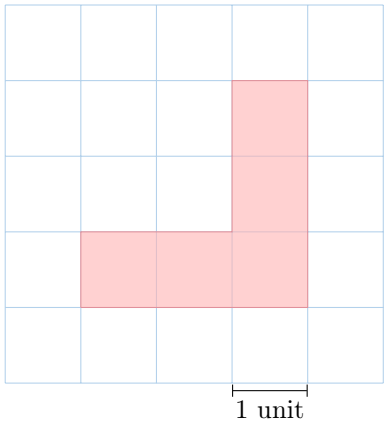
$\boxed{8}$ units

Answer:



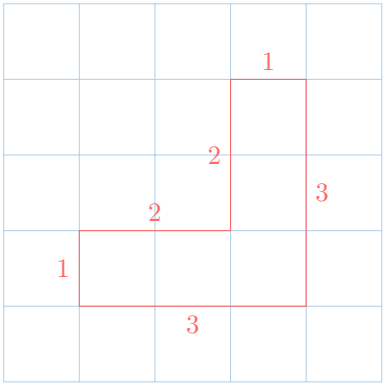
To find the perimeter, we add the length of all 4 sides : $2 + 2 + 2 + 2$.
The perimeter is 8 units.

Ex 2: What is the perimeter of the shaded figure?



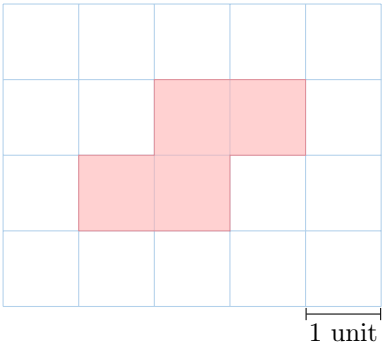
$\boxed{12}$ units

Answer:



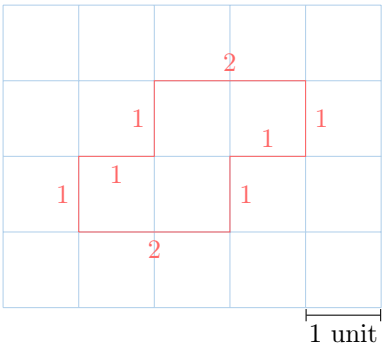
To find the perimeter, we add the length of all sides: $3 + 3 + 1 + 2 + 2 + 1$.
The perimeter is 12 units.

Ex 3: What is the perimeter of the shaded figure?



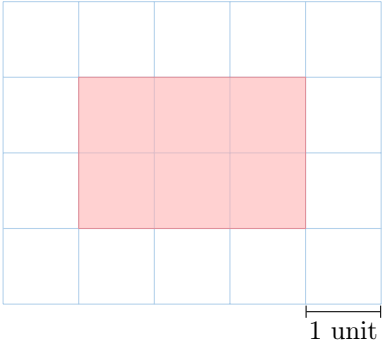
$\boxed{10}$ units

Answer:



To find the perimeter, we add the length of all sides: $2 + 1 + 1 + 1 + 2 + 1 + 1 + 1$.
The perimeter is 10 units.

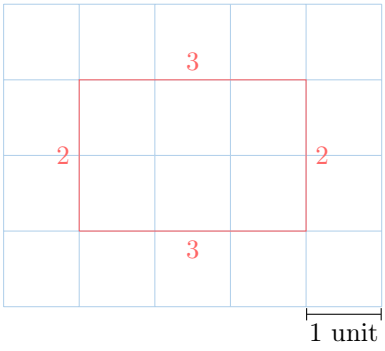
Ex 4: What is the perimeter of the shaded figure?



Answer:

$\boxed{10}$ units

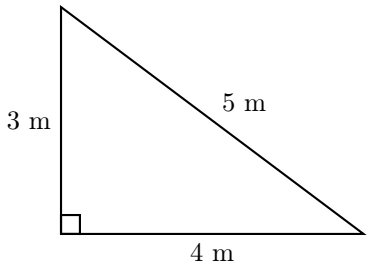
Answer:



To find the perimeter, we add the length of all sides: 3 + 2 + 3 + 2.
The perimeter is 10 units.

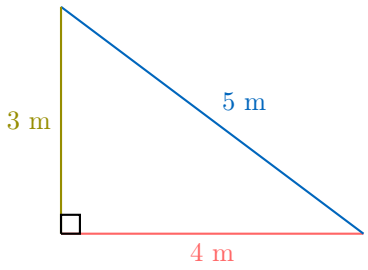
A.2 FINDING PERIMETER WHEN GIVEN SIDE LENGTHS

Ex 5: What is the perimeter of the right angle triangle?



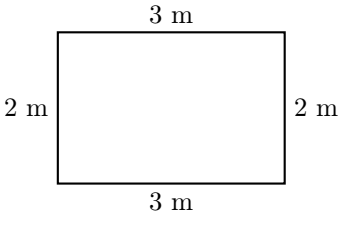
$\boxed{12}$ meters

Answer: We find the perimeter by adding all of the side lengths.



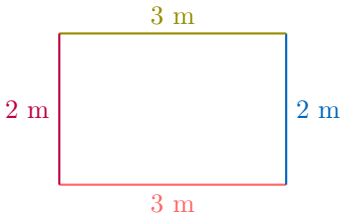
$$\text{Perimeter} = 4\text{ m} + 5\text{ m} + 3\text{ m}$$
$$= 12\text{ m}$$

Ex 6: What is the perimeter of the rectangle?



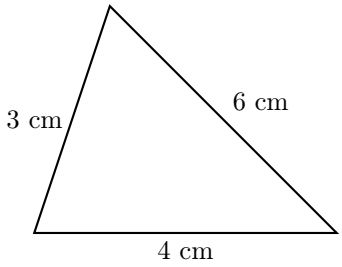
$\boxed{10}$ meters

Answer: We find the perimeter by adding all of the side lengths.



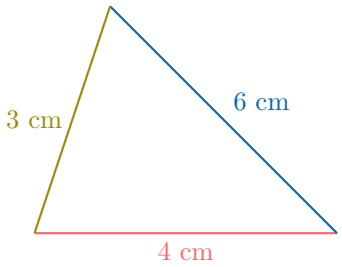
$$\text{Perimeter} = 3\text{ m} + 2\text{ m} + 3\text{ m} + 2\text{ m}$$
$$= 10\text{ m}$$

Ex 7: What is the perimeter of the scalene ?



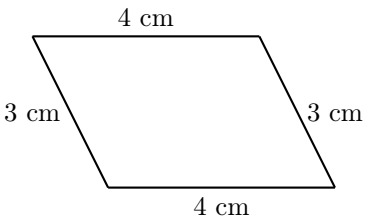
$\boxed{13}$ centimeters

Answer: We find the perimeter by adding all of the side lengths.



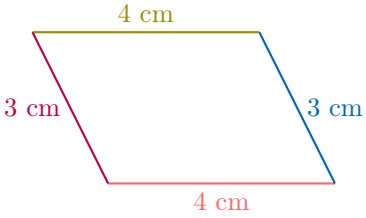
$$\text{Perimeter} = 4\text{ cm} + 6\text{ cm} + 3\text{ cm}$$
$$= 13\text{ cm}$$

Ex 8: What is the perimeter of the parallelogram?



$\boxed{14}$ centimeters

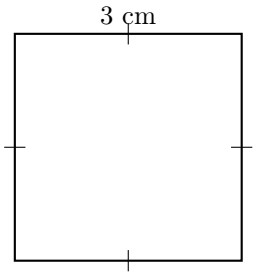
Answer: We find the perimeter by adding all of the side lengths.



$$\text{Perimeter} = 4\text{ cm} + 3\text{ cm} + 4\text{ cm} + 3\text{ cm}$$
$$= 14\text{ cm}$$

A.3 BUILDING EXPRESSIONS

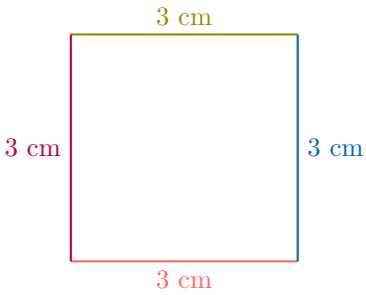
MCQ 9: Which of the following expressions can be used to find the perimeter of the square?
All sides are the same length.



Choose 2 answers:

- ☒ 4×3
- ☐ $4 + 3$
- ☒ $3 + 3 + 3 + 3$
- ☐ $3 + 3$

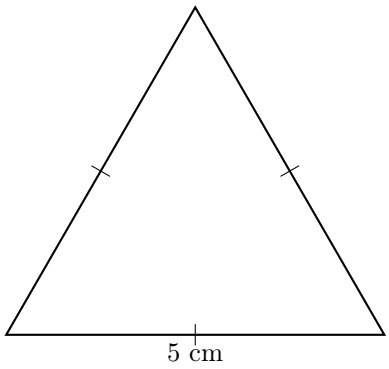
Answer: In the square, all sides are the same length.



$$\text{Perimeter} = 3 + 3 + 3 + 3$$
$$= 4 \times 3$$

So, the correct expressions are 4×3 and $3+3+3+3$, both equal to 12 cm.

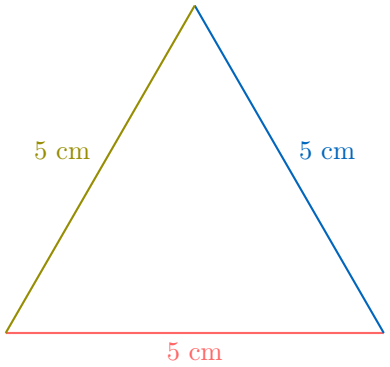
MCQ 10: Which of the following expressions can be used to find the perimeter of the equilateral triangle?
All sides are the same length.



Choose 2 answers:

- ☐ $5 + 3$
- ☒ 3×5
- ☒ $5 + 5 + 5$
- ☐ $5 + 5$

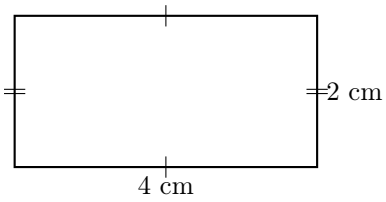
Answer: In the equilateral triangle, all sides are the same length.



$$\text{Perimeter} = 5 + 5 + 5$$
$$= 3 \times 5$$

So, the correct expressions are 3×5 and $5+5+5$, both equal to 15 cm.

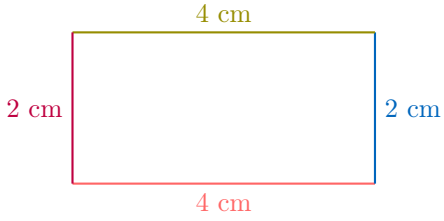
MCQ 11: Which of the following expressions can be used to find the perimeter of the rectangle?
Opposite sides are the same length.



Choose 2 answers:

- ☐ $2 + 4$
- ☒ $(2 \times 2) + (2 \times 4)$
- ☒ $4 + 4 + 2 + 2$
- ☐ 4×2

Answer: In the rectangle, opposite sides are the same length.

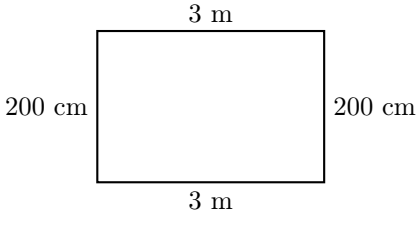


$$\text{Perimeter} = 4 + 4 + 2 + 2$$
$$= (2 \times 4) + (2 \times 2)$$

So, the correct expressions are $(2 \times 2) + (2 \times 4)$ and $4+4+2+2$, both equal to 12 cm.

A.4 FINDING PERIMETER WHEN GIVEN SIDE LENGTHS USING CONVERSION UNIT LENGTHS

Ex 12: What is the perimeter of the rectangle?



$\boxed{10}$ meters

Answer:

- **Convert to the same unit:**
  - *Division Method:*

$$200\,\text{cm} = 200 \div 100\,\text{m}$$
$$= 2\,\text{m}$$

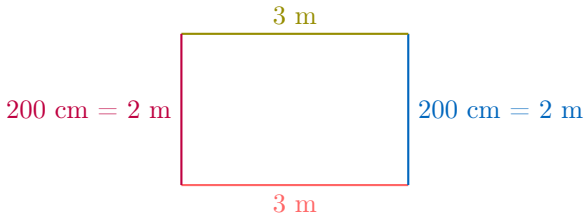
  - *Conversion Table Method:*

km			m		cm	mm
			2	0	0	

So,

$$200\,\text{cm} = 2\,\text{m}$$

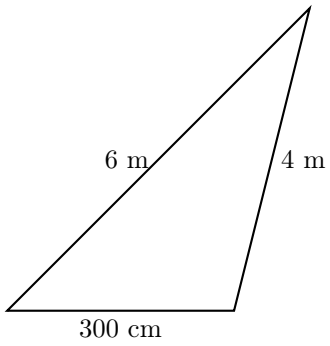
- **Add all the side lengths:**



$$\text{Perimeter} = 3\text{ m} + 2\text{ m} + 3\text{ m} + 2\text{ m}$$
$$= (3 + 2 + 3 + 2)\,\text{m}$$
$$= 10\,\text{m}$$

So, the perimeter of the rectangle is 10 meters.

Ex 13: What is the perimeter of the triangle?



$\boxed{13}$ meters

Answer:

- **Convert to the same unit:**
  - *Division Method:*

$$300\,\text{cm} = 300 \div 100\,\text{m}$$
$$= 3\,\text{m}$$

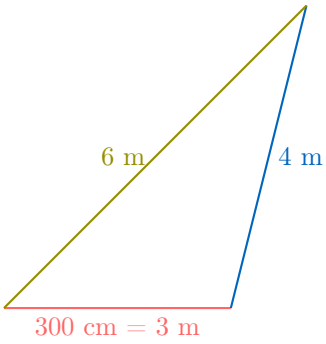
  - *Conversion Table Method:*

km			m		cm	mm
			3	0	0	

So,

$$300\,\text{cm} = 3\,\text{m}$$

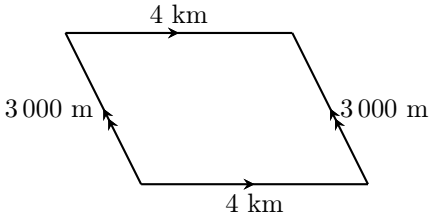
- **Add all the side lengths:**



$$\text{Perimeter} = 3\text{ m} + 4\text{ m} + 6\text{ m}$$
$$= (3 + 4 + 6)\,\text{m}$$
$$= 13\,\text{m}$$

So, the perimeter of the triangle is 13 meters.

Ex 14: What is the perimeter of the parallelogram?



$\boxed{14}$ kilometers

Answer:

- **Convert to the same unit:**
  - *Division Method:*

$$3\,000\,\text{m} = 3\,000 \div 1\,000\,\text{km}$$
$$= 3\,\text{km}$$

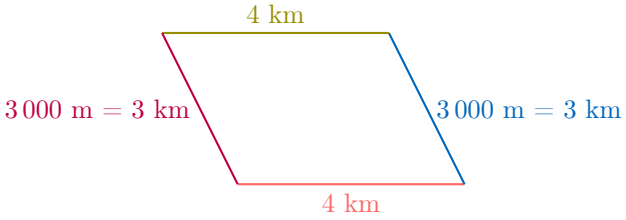
  - *Conversion Table Method:*

km			m		cm	mm
3	.	0	0	0		

So,

$$3\,000\,\text{m} = 3\,\text{km}$$

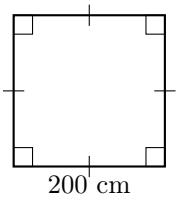
- **Add all the side lengths:**



$$\text{Perimeter} = 4\text{ km} + 3\text{ km} + 4\text{ km} + 3\text{ km}$$
$$= (4 + 3 + 4 + 3)\,\text{km}$$
$$= 14\,\text{km}$$

So, the perimeter of the parallelogram is 14 kilometers.

Ex 15: What is the perimeter of the square in meters?



8 meters

Answer:

- **Convert to the same unit:**
  - *Division Method:*

$$\begin{aligned} 200\,\text{cm} &= 200 \div 100\,\text{m} \\ &= 2\,\text{m} \end{aligned}$$

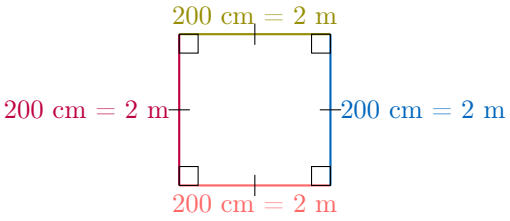
  - *Conversion Table Method:*

km			m		cm	mm
			2	0	0	

So,

$$200\,\text{cm} = 2\,\text{m}$$

- **Add all the side lengths:**The square has 4 sides, each 2 m.



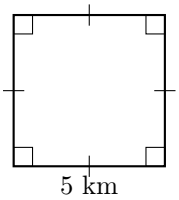
$$\begin{aligned} \text{Perimeter} &= 2\text{ m} + 2\text{ m} + 2\text{ m} + 2\text{ m} \\ &= (2+2+2+2)\,\text{m} \\ &= 4 \times 2\,\text{m} \\ &= 8\,\text{m} \end{aligned}$$

So, the perimeter of the square is 8 meters.

B PERIMETER OF COMMON SHAPES

B.1 FINDING PERIMETERS OF SQUARES AND RECTANGLES

Ex 16: What is the perimeter of the square?



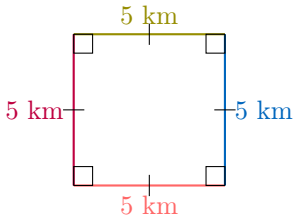
20 kilometers

Answer:

- **Method 1: Use the formula**

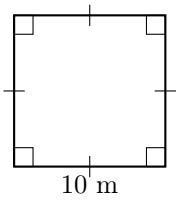
$$\begin{aligned} \text{Perimeter} &= 4 \times c \\ &= 4 \times 5 \\ &= 20\,\text{km} \end{aligned}$$

- **Method 2: Add all the side lengths**



$$\begin{aligned} \text{Perimeter} &= 5 + 5 + 5 + 5 \\ &= 4 \times 5 \\ &= 20\,\text{km} \end{aligned}$$

Ex 17: What is the perimeter of the square?



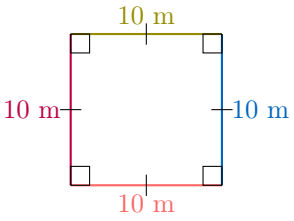
40 meters

Answer:

- **Method 1: Use the formula**

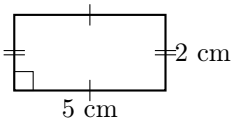
$$\begin{aligned} \text{Perimeter} &= 4 \times c \\ &= 4 \times 10 \\ &= 40\,\text{m} \end{aligned}$$

- **Method 2: Add all the side lengths**



$$\begin{aligned} \text{Perimeter} &= 10 + 10 + 10 + 10 \\ &= 4 \times 10 \\ &= 40\,\text{m} \end{aligned}$$

Ex 18: What is the perimeter of the rectangle?



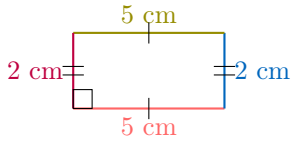
14 centimeters

Answer:

- **Method 1: Use the formula**

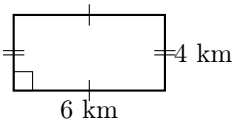
$$\begin{aligned}\text{Perimeter} &= (2 \times L) + (2 \times l) \\ &= (2 \times 5) + (2 \times 2) \\ &= 10 + 4 \\ &= 14\,\text{cm}\end{aligned}$$

- **Method 2: Add all the side lengths**



$$\begin{aligned}\text{Perimeter} &= 5 + 2 + 5 + 2 \\ &= 14\,\text{cm}\end{aligned}$$

Ex 19: What is the perimeter of the rectangle?



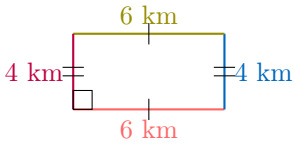
$\boxed{20}$ kilometers

Answer:

- **Method 1: Use the formula**

$$\begin{aligned}\text{Perimeter} &= (2 \times l) + (2 \times w) \\ &= (2 \times 6) + (2 \times 4) \\ &= 12\,\text{km} + 8\,\text{km} \\ &= 20\,\text{km}\end{aligned}$$

- **Method 2: Add all the side lengths**



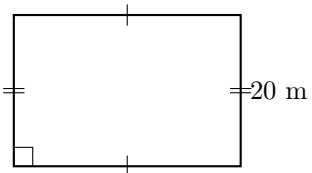
$$\begin{aligned}\text{Perimeter} &= 6 + 4 + 6 + 4 \\ &= 20\,\text{km}\end{aligned}$$

B.2 SOLVING PROBLEMS

Ex 20: A farmer wants to build a fence around a rectangular field that measures 30 m by 20 m. The cost of the fence is 10 dollars per meter. What is the total cost to build the fence around the field?

$\boxed{1000}$ dollars

Answer:

- 

- **Find the perimeter of the rectangular field:** Using the formula for the perimeter of a rectangle:

$$\begin{aligned}\text{Perimeter} &= (2 \times l) + (2 \times w) \\ &= (2 \times 30) + (2 \times 20) \\ &= 60\,\text{m} + 40\,\text{m} \\ &= 100\,\text{m}\end{aligned}$$

- **Calculate the cost of the fence:** The cost is 10 dollars per meter, and the perimeter is 100 m:

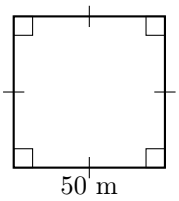
$$\begin{aligned}\text{Total cost} &= \text{Perimeter} \times \text{Cost per meter} \\ &= 100 \times 10 \\ &= 1\,000\,\text{dollars}\end{aligned}$$

So, the total cost to build the fence is 1 000 dollars.

Ex 21: A park manager wants to install a pathway of lights around a square park that has a side length of 50 m. The cost of installing the lights is 15 dollars per meter. What is the total cost to install the lights around the park?

$\boxed{3000}$ dollars

Answer:

- 

- **Find the perimeter of the square park:** Using the formula for the perimeter of a square:

$$\begin{aligned}\text{Perimeter} &= 4 \times s \\ &= 4 \times 50 \\ &= 200\,\text{m}\end{aligned}$$

- **Calculate the cost of the lights:** The cost is 15 dollars per meter, and the perimeter is 200 m:

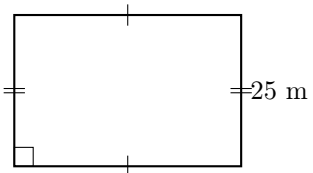
$$\begin{aligned}\text{Total cost} &= \text{Perimeter} \times \text{Cost per meter} \\ &= 200 \times 15 \\ &= 3\,000\,\text{dollars}\end{aligned}$$

So, the total cost to install the lights is 3 000 dollars.

Ex 22: A school wants to create a border of flowers around a rectangular garden that measures 40 m by 25 m. The cost of planting the flowers is 8 dollars per meter. What is the total cost to create the flower border around the garden?

$\boxed{1040}$ dollars

Answer:

- 

- **Find the perimeter of the rectangular garden:** Using the formula for the perimeter of a rectangle:

$$\begin{aligned}\text{Perimeter} &= (2 \times l) + (2 \times w) \\ &= (2 \times 40) + (2 \times 25) \\ &= 80\,\text{m} + 50\,\text{m} \\ &= 130\,\text{m}\end{aligned}$$

- **Calculate the cost of the flower border:** The cost is 8 dollars per meter, and the perimeter is 130 m:

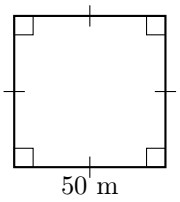
$$\begin{aligned}\text{Total cost} &= \text{Perimeter} \times \text{Cost per meter} \\ &= 130 \times 8 \\ &= 1\,040\,\text{dollars}\end{aligned}$$

So, the total cost to create the flower border is 1 040 dollars.

Ex 23: To celebrate a community event, children form a human chain to surround a square park with a side length of 50 m. If 2 children are needed per meter, how many children are required to surround the park?

$\boxed{400}$ children

Answer:

- 

- **Find the perimeter of the square park:** Using the formula for the perimeter of a square:

$$\begin{aligned}\text{Perimeter} &= 4 \times s \\ &= 4 \times 50 \\ &= 200\,\text{m}\end{aligned}$$

- **Calculate the number of children needed:** There are 2 children per meter, and the perimeter is 200 m:

$$\begin{aligned}\text{Total children} &= \text{Perimeter} \times \text{Children per meter} \\ &= 200 \times 2 \\ &= 400\,\text{children}\end{aligned}$$

So, the total number of children needed to surround the park is 400 children.