

What's Going On?

Checking In

Minds on

To Minimize or To Maximize?

Action!

iPad Investigation

Consolidation Optimizing 2.0

Learning Goal - I will be able to optimize the perimeter and area of rectangles.

 Checking In

Last Unit!

Optimization

Checking In

This Week

Tuesday - Optimizing Rectangles

Wednesday - Optimizing Square-Based Prisms

Thursday - Optimizing Cylinders

Friday - Work Period and Assignment

Minds on

To Maximize or To Minimize?

You need to enclose a **set** amount of space (**area**) for a garden. First, you need to know how much fencing you will need to purchase.

Do you want to minimize or maximize the perimeter?

Minds on

To Maximize or To Minimize?

You are trying to enclose an area for your dog in the backyard. You have purchased a **set** amount of fencing (**perimeter**).

Do you want to maximize or minimize the enclosed area?

Action!

iPad Investigations

"minimize perimeter"

"maximize area"

Perimeter

When we are trying to “optimize” the perimeter of a given area, we are looking to

minimize the perimeter. “make a square”

Formulae

We know area

$$l = w$$

$$A = l^2 \quad \text{OR} \quad A = w^2$$

$$P = 4l \quad \text{OR} \quad P = 4w$$

$$l = \sqrt{A} \quad \text{OR} \quad w = \sqrt{A}$$

Area

When we are trying to “optimize” the area of a space given the perimeter, we are looking to maximize the area.

Formulae

make a square
 $l = w$

$$\begin{array}{l} A = l^2 \quad \text{OR} \quad A = w^2 \\ P = 4l \quad \text{OR} \quad P = 4w \\ \boxed{l = \frac{P}{4} \quad \text{OR} \quad w = \frac{P}{4}} \end{array}$$

Area on Three Sides

When we are trying to “optimize” the area of a space that will be enclosed on three sides and we are given the amount of materials available, we are looking to

~~maximize~~ the area.

Formulae

width is half the length

$$\rightarrow w = \frac{l}{2}$$

length is double the width

$$\rightarrow l = 2w$$

length is half the "perimeter"

$$\rightarrow l = \frac{P}{2}$$

width is a quarter of the "perimeter"

$$\rightarrow w = \frac{P}{4}$$

Action!

Formulating Formal Formula

Optimizing Perimeter (Fixed Area)

Action!

Formulating Formal Formula

Optimizing Area (Fixed Perimeter)

Action!

Formulating Formal Formula

Optimizing Area on Three Sides
(Fixed Amount of Material)

Consolidation

Optimizing 2.0

You have 110 metres of fencing

a. If you want to enclose an area on 4 sides. What is the maximum area you can enclose on 4 sides? What are the dimensions of the area?

$$l = \frac{110}{4}$$

$$l = 27.5 \text{ m}$$

$$A = 27.5 \times 27.5$$

$$A = 756.25 \text{ m}^2$$

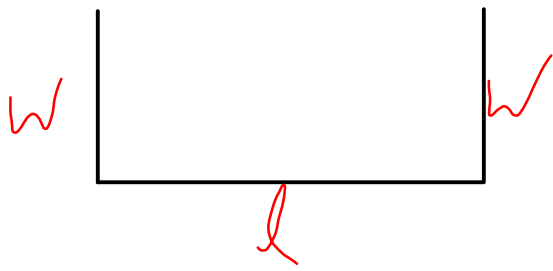
dimensions are 27.5×27.5

Consolidation

Optimizing 2.0

You have 110 metres of fencing

b. What is the maximum area you can enclose on 3 sides? What are the possible dimensions of the area?

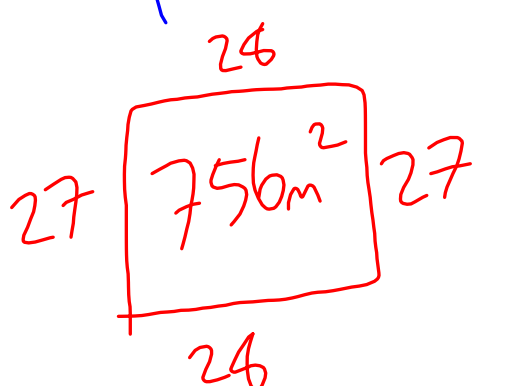

$$l = \frac{110}{2}$$
$$l = 55$$
$$w = \frac{55}{2}$$
$$w = 27.5$$
$$A = 55 \times 27.5$$
$$= 1512.5 \text{ m}^2$$

Consolidation

Optimizing 2.0

You have 110 metres of fencing. **The fencing is in one-metre long sections that cannot be cut.**

a. If you want to enclose an area on 4 sides. What is the maximum area you can enclose on 4 sides? What are the dimensions of the area?

$$\frac{110}{4} = 27.5$$


A hand-drawn diagram of a rectangle. The top and bottom sides are labeled '26' in red. The left and right sides are labeled '27' in red. Inside the rectangle, the area is written as '756m²' in red. The rectangle is drawn with red lines.

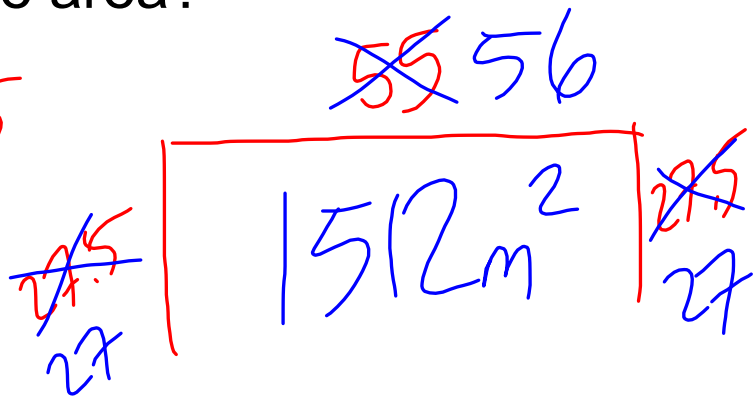
Consolidation

Optimizing 2.0

You have 110 metres of fencing. **The fencing is in one-metre long sections that cannot be cut.**

b. What is the maximum area you can enclose on 3 sides? What are the possible dimensions of the area?

$$Q = \frac{110}{2} = 55$$



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1 - 3, 5, 6, 8