

What's Going On?

Checking In

Minds on

Revisiting Yesterday's Work

Action!

iPad Investigations

Consolidation

Formulating Formal Formulae

Learning Goal - I will be able to optimize the volume and surface area of square-based prisms and cylinders.

Checking In

Outstanding Items

Surveys

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Assignments

Hand in by end of day... returned tomorrow.

Hand in tomorrow at start of class, accepted.

Otherwise, not.

Checking In

Dis Week

~~Monday - Optimizing Perimeter and Area~~

Tuesday - Optimizing Volume and Surface Area

Wednesday - Practice / Review

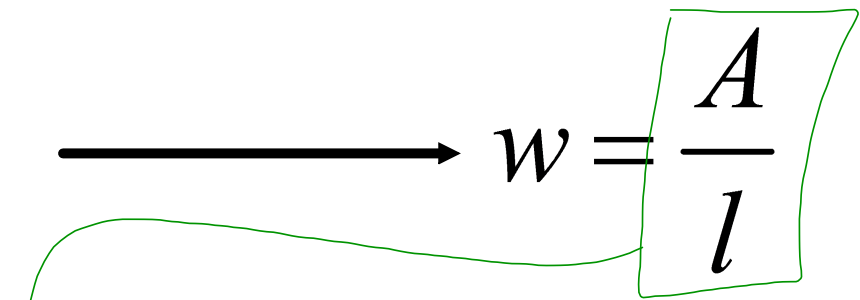
Thursday - Practice / Review

Friday - Test

Minds on

Revisiting Yesterday's Work

Minimizing Perimeter of Rectangle Given Area

$$A = lw \longrightarrow w = \frac{A}{l}$$


$$P = 2l + 2w \longrightarrow P = 2l + 2\left(\frac{A}{l}\right)$$

<https://www.desmos.com/calculator/hvdkwf0blk>

Minds on

Revisiting Yesterday's Work

Maximizing Area of Rectangle Given Perimeter

$$P = 2l + 2w \longrightarrow w = \frac{P - 2l}{2}$$

$$A = lw \longrightarrow A = l \left(\frac{P - 2l}{2} \right)$$

<https://www.desmos.com/calculator/scg791lzuh>

Minds on

Revisiting Yesterday's Work

Maximizing Area of Rectangle on Three Sides

$$P = l + 2w \longrightarrow w = \frac{P - l}{2}$$

$$A = lw \longrightarrow A = l \left(\frac{P - l}{2} \right)$$

<https://www.desmos.com/calculator/v0mjuuuljy>

Minds on

To Minimize or To Maximize?

You have started a cereal company. You want to package 500 g of cereal. To do so, you need a box.

Do you want to minimize or maximize the surface area of the box? Why?

Minds on

To Minimize or To Maximize?

You want to send a care package to a friend. You have a particular amount of cardboard to use to make a box.

Do you want to minimize or maximize the volume of the box? Why?

no' stuff

Action!

iPad Investigations

Consolidation

Formulating Formal Formula

Square-Based Prisms

Optimizing Volume (Fixed Surface Area)

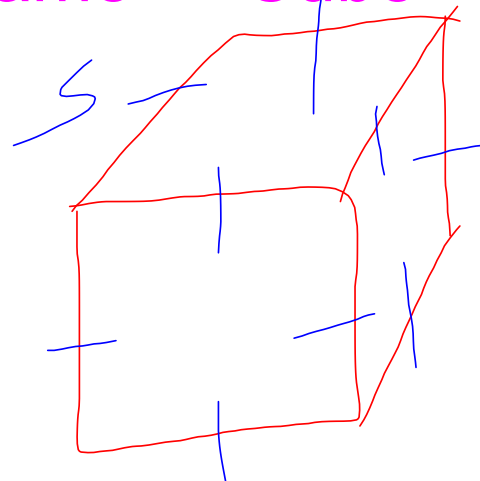
All sides the same \Rightarrow Cube

$$V = lwh$$

$$V = s \times s \times s$$

$$V = s^3$$

$$s = \sqrt[3]{V}$$



Consolidation

Formulating Formal Formula

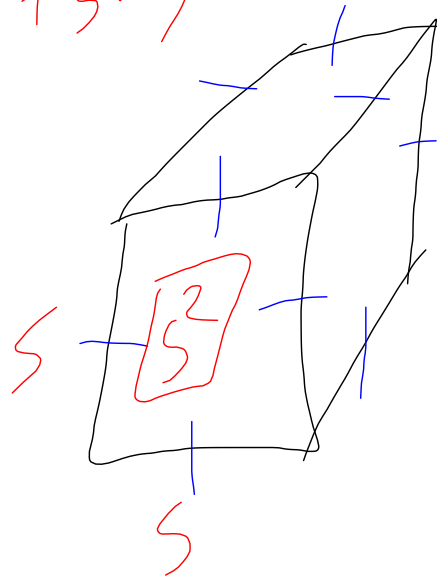
Square-Based Prisms

Optimizing Surface Area (Fixed Volume)

$$SA = 2(\overset{s}{l}\overset{s}{w} + \overset{s}{l}h + \overset{s}{w}h)$$

$$SA = 2(s^2 + s^2 + s^2)$$

$$SA = 2(3s^2)$$



$$SA = 6s^2$$

$$s = \sqrt{\frac{SA}{6}}$$

Consolidation

Formulating Formal Formula

Cylinders

Optimizing Volume (Fixed Surface Area)

$$V = \pi r^2 h$$

$$h = 2r$$

$$V = \pi r^2 (2r)$$

$$V = 2\pi r^3$$

$$r = \sqrt[3]{\frac{V}{2\pi}}$$

Consolidation

Formulating Formal Formula

Cylinders

Optimizing Surface Area (Fixed Volume)

Height is twice the radius

$$SA = 2\pi r^2 + 2\pi r h \quad (h = 2r)$$

$$SA = 2\pi r^2 + 2\pi r (2r)$$

$$SA = 2\pi r^2 + 4\pi r^2$$

$$SA = 6\pi r^2$$
$$r = \sqrt{\frac{SA}{6\pi}}$$

Consolidation

Homework

Pg. 60 - 63

1 - 2 (Basics)

3 - 7, 9, 10

Challenge: 15, 16