What's Going On?

Checking In

Minds on Prisms

Action! Pyramids

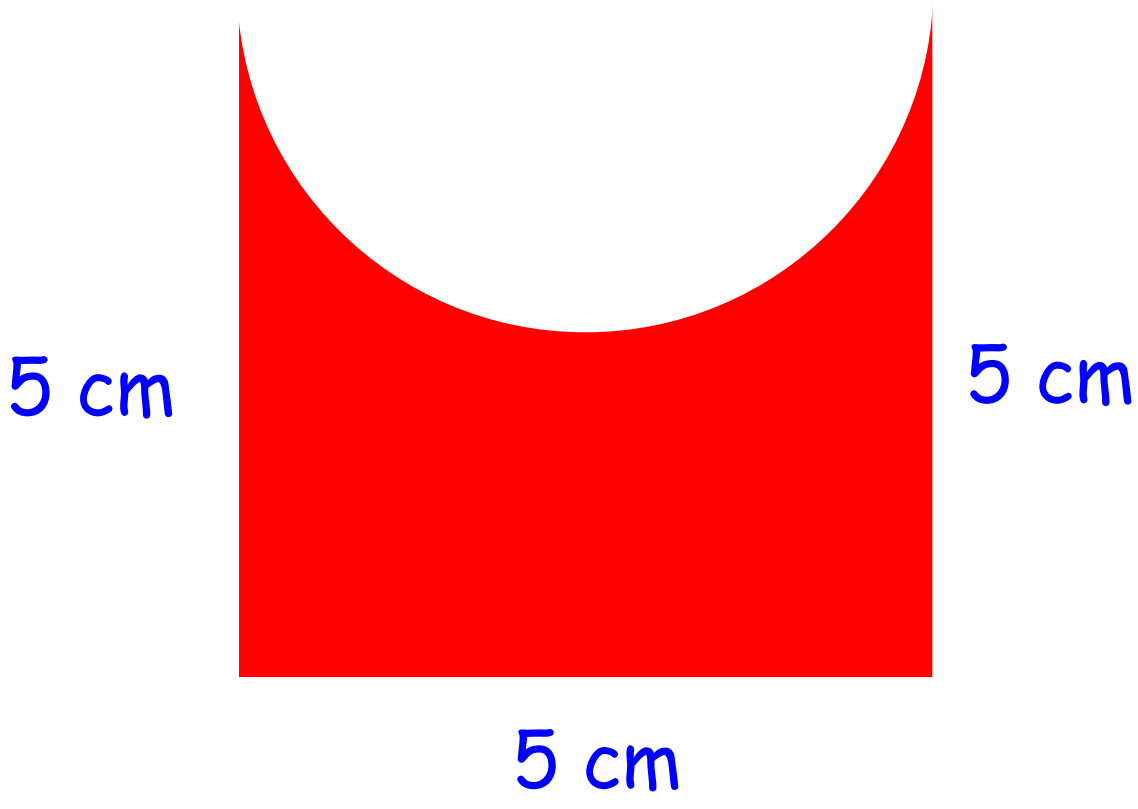
Consolidation Popping the Question

Learning Goal - I will deduce the formulae for the surface area of prisms and pyramids.

Checking In

F.F.M.

Determine the **perimeter** and **area** of the shaded figure below



Area

A = area of square − area of semi-circle

$$A = (5 \times 5) - \frac{\pi r^2}{2}$$

$$A = 25 - \frac{\pi (2.5)^2}{2}$$

$$A = 25 - \frac{\pi (6.25)}{2}$$

$$A = 25 - \frac{19.63}{2}$$

$$A = 25 - 9.82$$

$$A = 15.18 \text{ cm}^2$$

Perimeter

$P = 5 + 5 + 5$ + the circumference of half a circle

$C = 2\pi r$

$C = 2\pi(2.5)$

$C = 15.7$

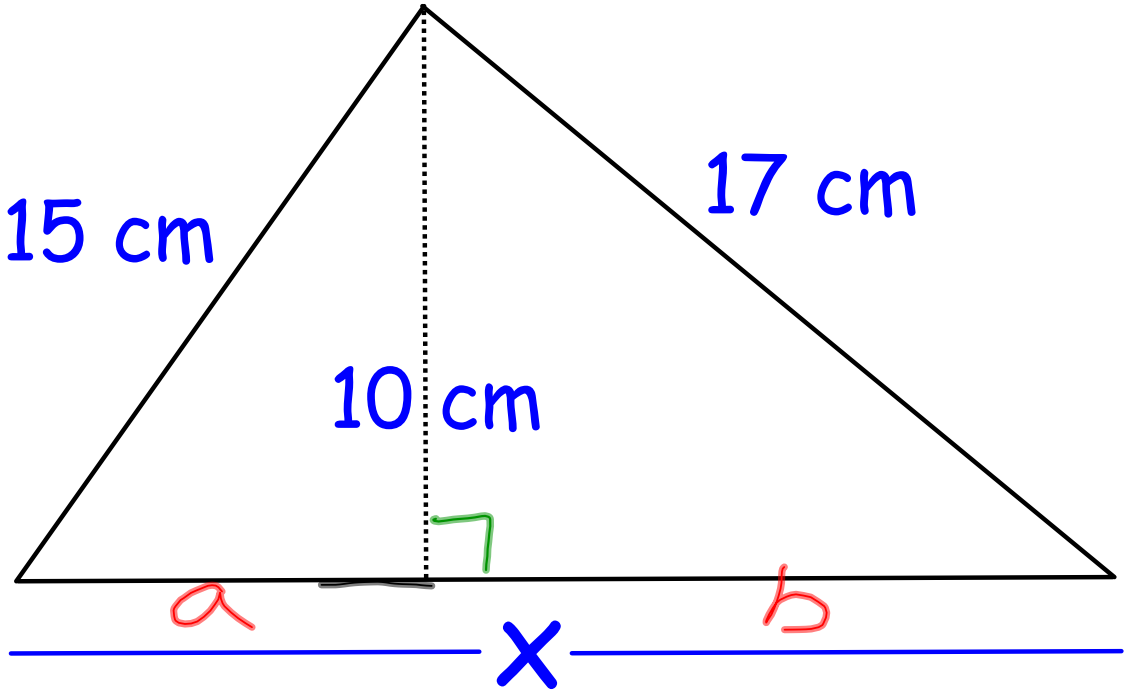
divide by 2 for half a circle: $\frac{15.7}{2} = 7.85$

$P = 5 + 5 + 5 + 7.85$

$P = 22.85\text{cm}$

Checking In

F.T.M.



First, we need to break side x into two parts. Let's call them a and b

To find a

$a^2 = 15^2 - 10^2$

To find b

$b^2 = 17^2 - 10^2$

$a^2 = 15^2 - 10^2$

$a^2 = 225 - 100$

$\sqrt{a^2} = \sqrt{125}$

$a = 11.2$

$b^2 = 17^2 - 10^2$

$b^2 = 289 - 100$

$\sqrt{b^2} = \sqrt{189}$

$b = 13.7$

$x = a + b$

$x = 11.2 + 13.7$

$x = 24.9 \text{ cm}$

Checking In

Unit 7: Measurement

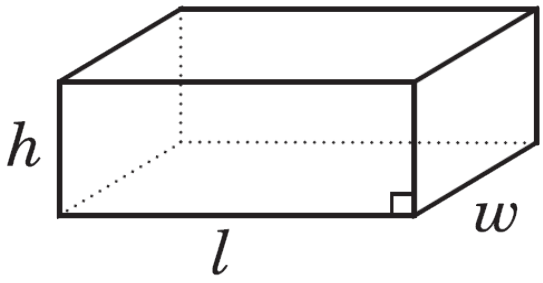
Day 3: Surface Area of Prisms and Pyramids

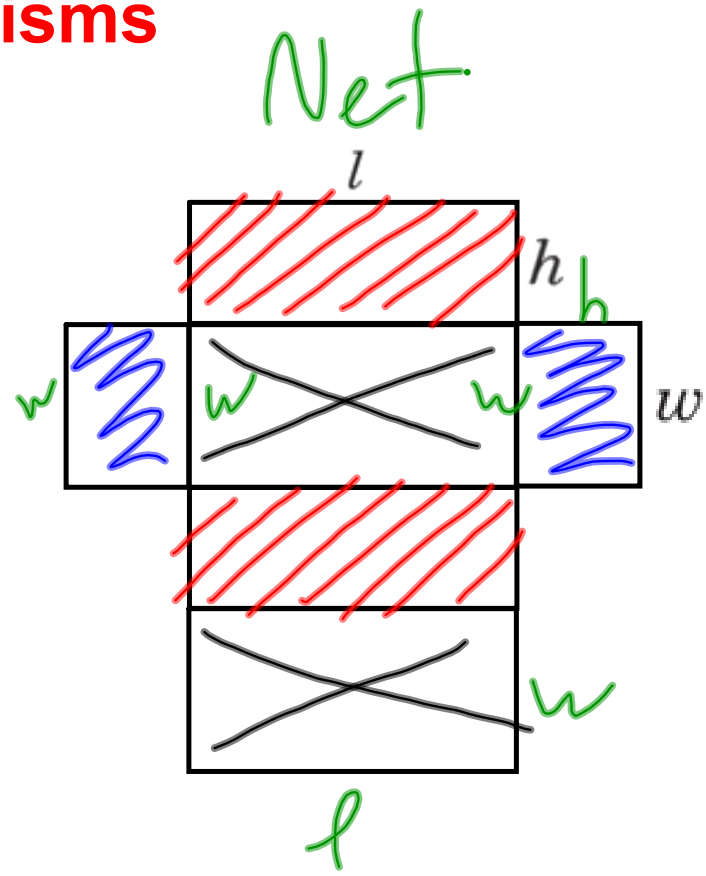
Minds on

The Formulae

Prisms

Rectangular Prism





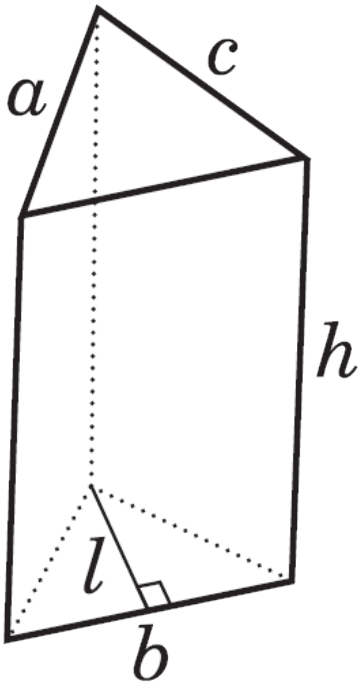
$$SA = A_{rectangles}$$
$$= wh + wh + lw + lw + lh + lh$$
$$= 2wh + 2lw + 2lh$$
$$= 2(wh + lw + lh)$$

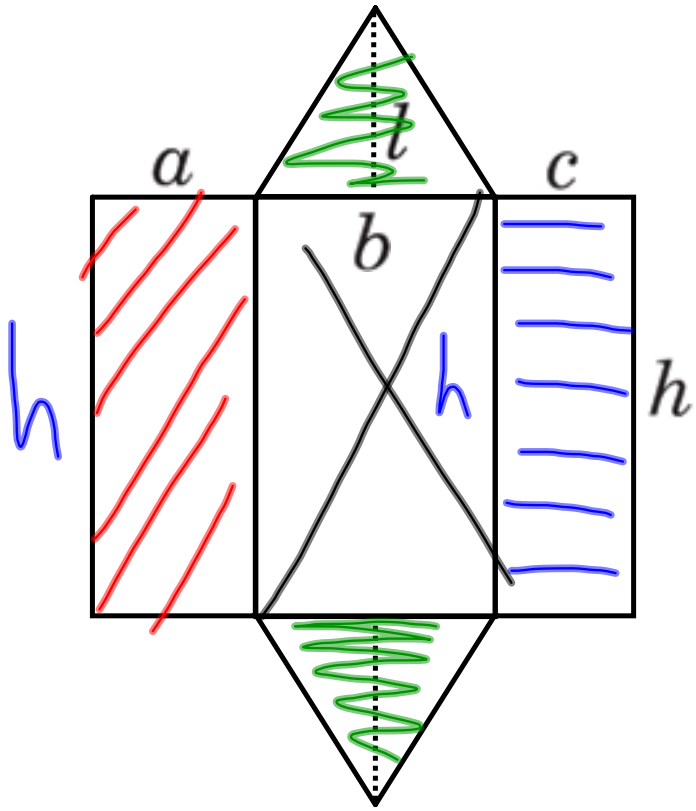
Minds on

Prisms

Triangular Prism

Net





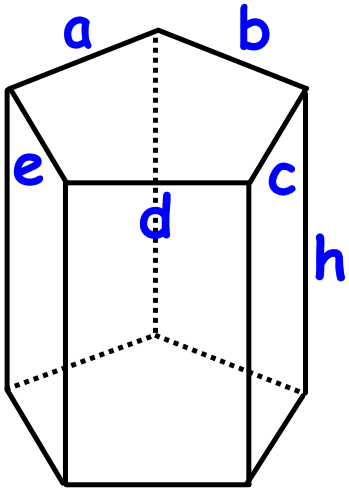
$$SA = A_{rectangles} + 2A_{base}$$

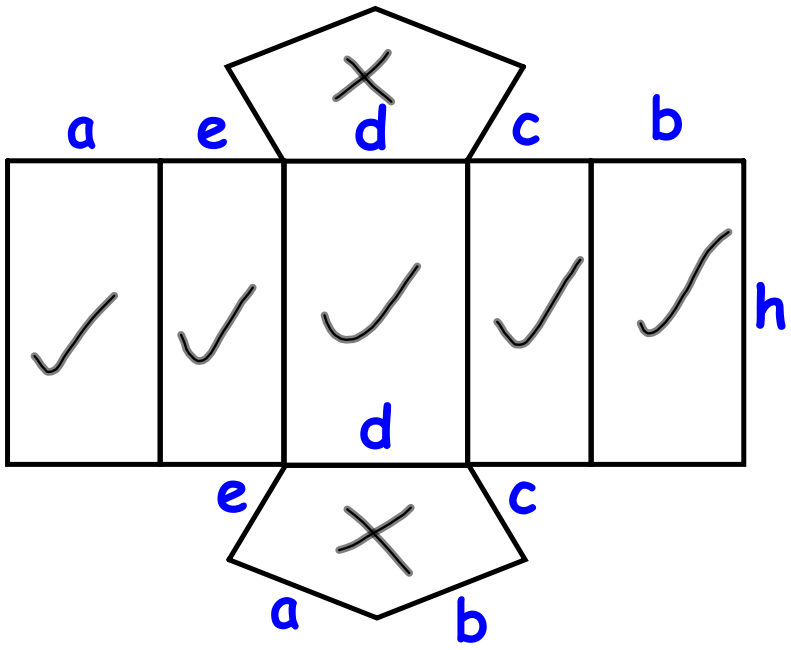
$$= ah + bh + ch + 2\left(\frac{bl}{2}\right)$$

$$= ah + bh + ch + bl$$

Minds on

Prisms





$SA = A_{rectangles} + 2A_{base}$

$= ah + bh + ch + dh + eh + 2(A_{pentagon})$

Consolidation

The Formulae

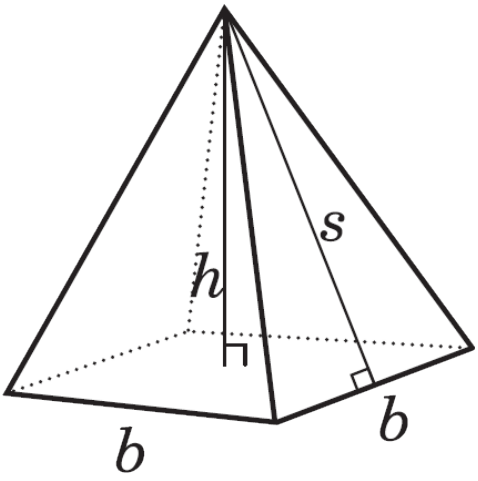
ANY PRISM

$$SA = A_{rectangles} + 2A_{base}$$

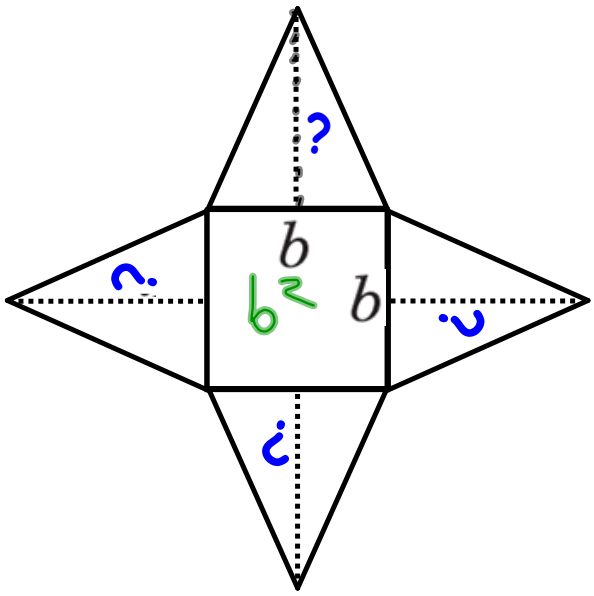
Action!

Square-Based Pyramid

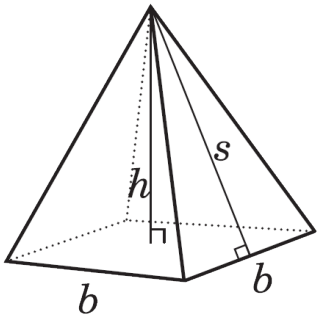
3-D Diagram



Net Diagram



$$Surface\ Area = b^2 + 4\left(\frac{bs}{2}\right)$$



$$Surface\ Area = b^2 + 4\left(\frac{bs}{2}\right)$$

But the formula sheet says 2bs + b^2...
what gives?!

$$Surface\ Area = b^2 + 4\left(\frac{bs}{2}\right)$$

SO...

$$Surface\ Area = b^2 + 2bs$$

Action!

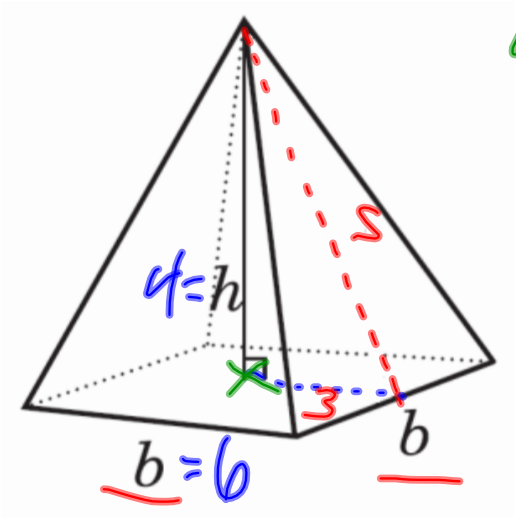
Use Your Words

Explain, in words, how to determine the surface area of a square-based pyramid given **ONLY** the height (*h*) and base (*b*).

$h = 4$

$b = 6$

$SA = b^2 + 2bs$



Create a right triangle inside the pyramid.
Make sure to use half of b as the base!
Then use the Pythagorean Theorem to find the slant height s.

Consolidation

Homework

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1, 3, 5a, 7b