NOVEMBER 2, 2018

UNIT 3: SQUARE ROOTS AND SURFACE AREA

SECTION 1.4: SURFACE AREAS OF OTHER COMPOSITE OBJECTS

K. SEARS
MATH 9

Nov 4-8:22 AM

WHAT'S THE POINT OF TODAY'S LESSON?

We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 2" OR "SS2" which states:

SS2: "Determine the surface area of composite 3-D objects to solve problems."

Nov 4-8:22 AM

What does THAT mean???

SCO SS2 means that we will stack two or more 3-D objects (right rectangular prisms, right triangular prisms, right cylinders) on top of each other. We will find the area of each face (side) of each object then add them all up to find the total surface area of the object. We will also have to subtract any overlapping sides from the total.

Nov 4-8:22 AM

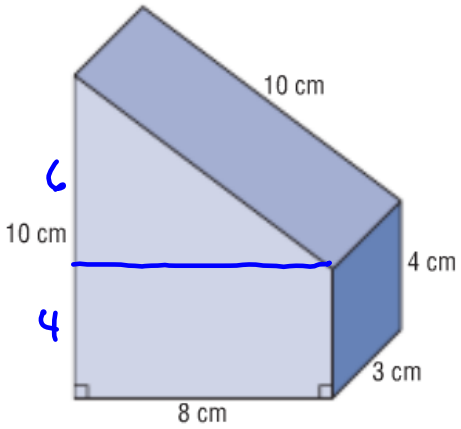
You STILL only need to remember 5 formulas in the surface area section of this unit which you already knew before grade 9:

1. **Area of a rectangle/square:** bh
2. **Area of a triangle:** $\frac{bh}{2}$
3. **Area of a circle:** πr^2
4. **Circumference of a circle:** $2\pi r$ **OR** πd
5. **The Pythagorean Theorem:** $a^2 + b^2 = c^2$

Nov 14-2:30 PM

Page 34, Example 1:

Determine the surface area of this object.



Top

$A_{triangle} = \frac{bh}{2} \times 2$

$= \frac{(8)(6)}{2} \times 2$

$= 48 cm^2$

$A_{slant} = (10)(3)$

$= 30 cm^2$

$A_{back} = 6 \times 3$

$= 18 cm^2$

$96 cm^2$

Bottom

$A_{front/back} = 8 \times 4 \times 2$

$= 64 cm^2$

$A_{ends} = 3 \times 4 \times 2$

$= 24 cm^2$

$A_{bottom} = 8 \times 3$

$= 24 cm^2$

$112 cm^2$

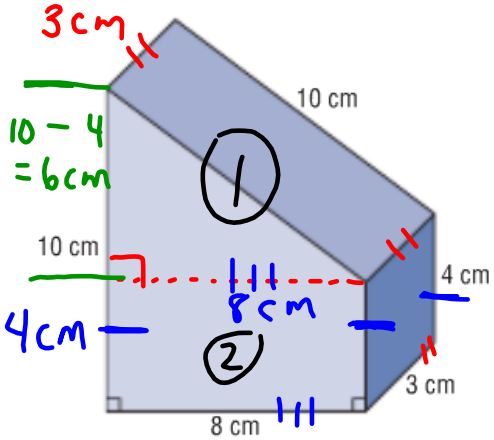
$A_{total} = 96 + 112$

$= 208 cm^2$

Oct 1-2:22 PM

Page 34, Example 1:

Determine the surface area of this object.



S.A. (1) = T + F/B + L

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

$= (10 \times 3) + 2\left(\frac{8 \times 6}{2}\right) + (3 \times 6)$

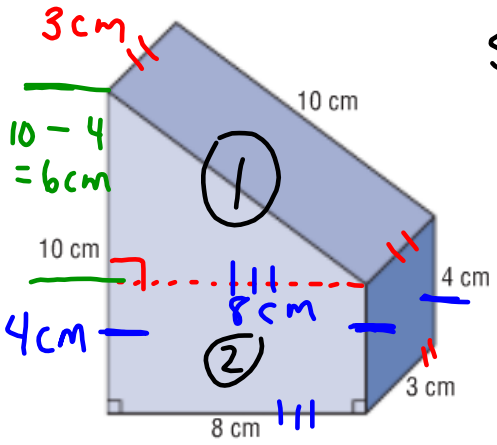
$= 30 + 48 + 18$

$= 96 cm^2$

Nov 13-12:22 PM

Page 34, Example 1:

Determine the surface area of this object.



S.A. ② = B + F/B + 4/R

= bh + 2bh + 2bh

(8 × 3) + 2(8 × 4) + 2(3 × 4)

= 24 + 64 + 24

= 112 cm²

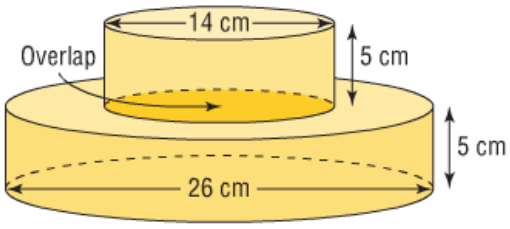
Total S.A. = ① + ②

= 96 + 112

= 208 cm²

Nov 13-12:22 PM

Page 36, Example 2:

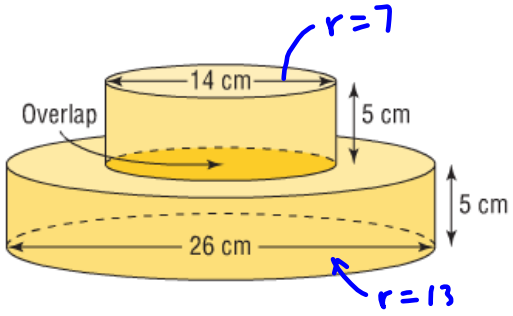


Cylinder

$A = 2\pi r^2 + 2\pi rh$

NOTE: NO icing underneath bottom layer or in between layers.

Oct 1-2:43 PM



$A = 2\pi r^2 + 2\pi rh$

Top

$A = \pi r^2 + 2\pi rh$

$= \pi(7)^2 + 2\pi(7)(5)$

$= 49\pi + 70\pi$

$= 119\pi$

Bottom

$A = \pi r^2 + 2\pi rh - 49\pi$

$= \pi(13)^2 + 2\pi(13)(5) - 49\pi$

$= 169\pi + 130\pi - 49\pi$

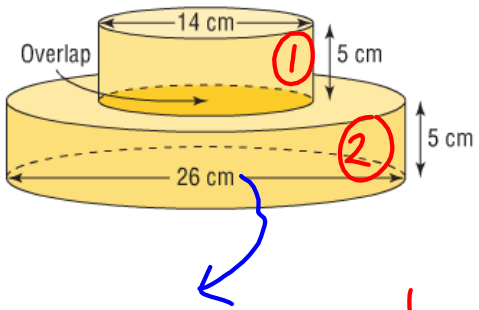
$= 250\pi$

$A_{total} = 119\pi + 250\pi$

$= 369\pi$

$= 1158.7\,cm^2$

Nov 2-8:23 AM



$r = \frac{d}{2}$

$r = \frac{26}{2}$

$r = 13\,cm$

S.A. = ① + ②

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

$= [\pi(14)(5)] + [\pi(13^2) + \pi(26)(5)]$

$\doteq (219.9115) + (530.9292 + 408.4070)$

$\doteq (219.9115) + (939.3362)$

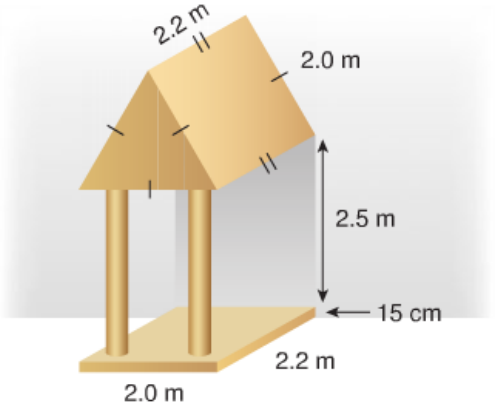
$\doteq 1159.2477$

$\doteq 1159\,cm^2$

Nov 13-12:23 PM

Page 38, Example 3:

The roof, columns, and base of this porch are to be painted.
The radius of each column is 20 cm.
What is the area to be painted, to the nearest square metre?



Oct 1-3:00 PM

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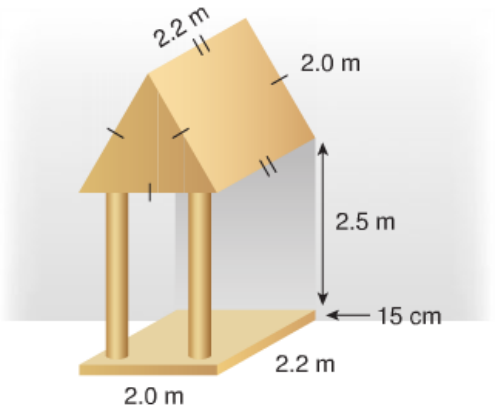

Oct 1-3:00 PM

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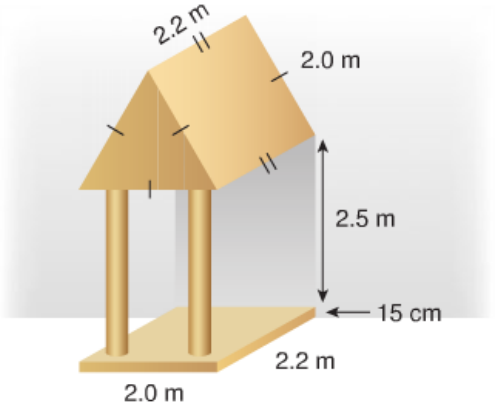

Oct 1-3:00 PM

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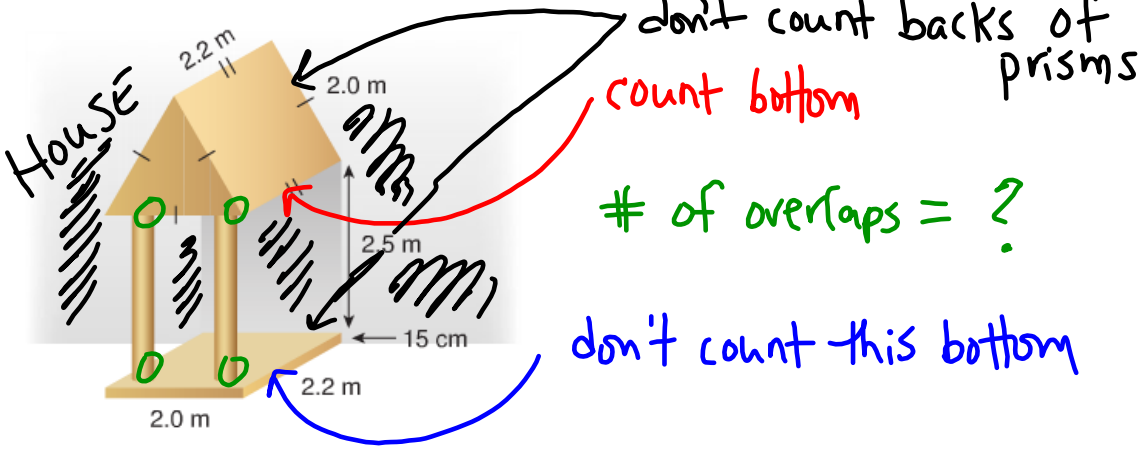
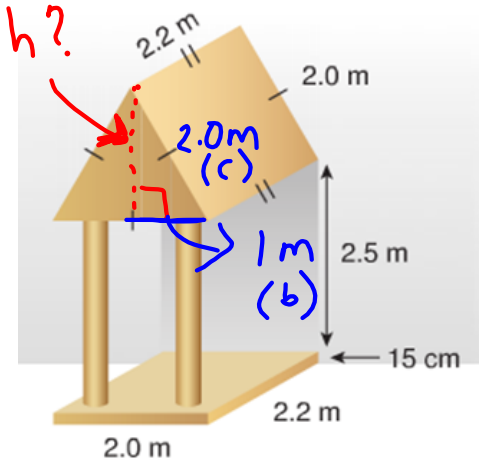


Nov 13-12:24 PM

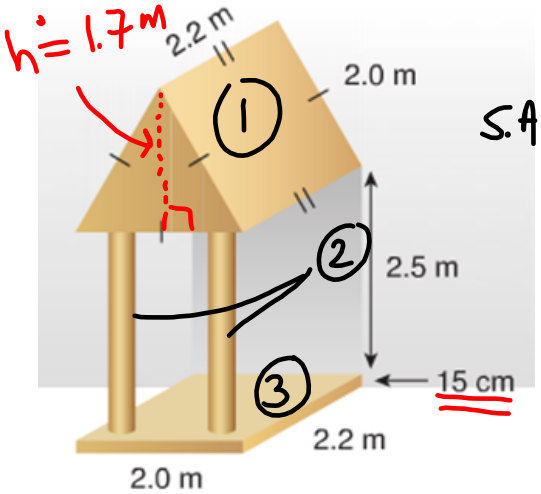
Page 38, Example 3:



$$h^2 + b^2 = c^2$$
$$h^2 + 1^2 = 2^2$$
$$h^2 + 1 = 4$$
$$h^2 = 4 - 1$$
$$h^2 = 3$$
$$\sqrt{h^2} = \sqrt{3}$$
$$h \doteq 1.7321\ldots$$
$$h \doteq 1.7 \text{ m}$$

Nov 13-12:25 PM

Page 38, Example 3:

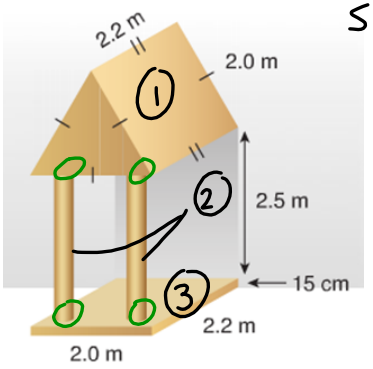


S.A. ① = F + Bottom + 4 R

$$= \frac{bh}{2} + 3bh$$
$$\doteq \left(\frac{2 \times 1.7}{2}\right) + 3(2.2 \times 2)$$
$$\doteq 1.7 + 13.2$$
$$\doteq 14.9 \text{ m}^2$$

Nov 13-12:25 PM

Page 38, Example 3:



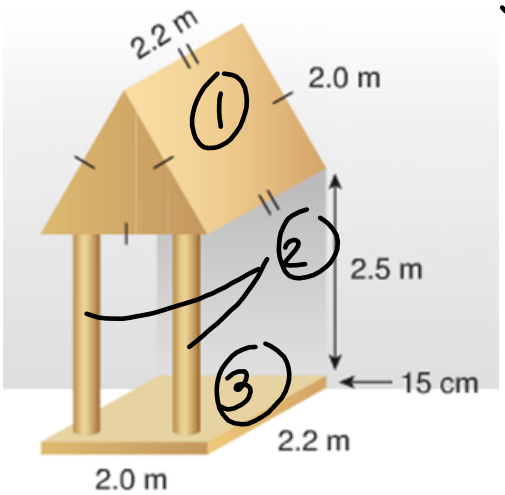
O = Overlap

$$S.A.(2) = 2(\text{T/B} + \text{Middle})$$
$$= 2(2\pi r^2 + 2\pi rh)$$
$$= 2[2\pi(0.2^2) + 2\pi(0.2)(2.5)]$$
$$\doteq 2(0.2513 + 3.1416)$$
$$\doteq 2(3.3929)$$
$$\doteq 6.7858$$
$$\doteq 6.8\ m^2$$

$$\doteq 4.8\ m^2$$

Nov 13-12:25 PM

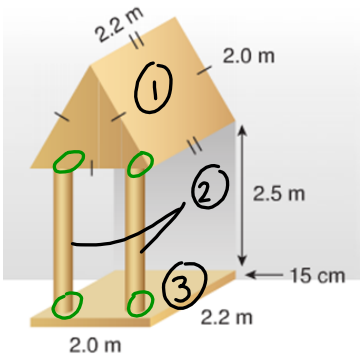
Page 38, Example 3:



$$S.A.(3) = T + F + L|R$$
$$= bh + bh + 2bh$$
$$(2 \times 2.2) + (2 \times 0.15) + 2(2.2 \times 0.15)$$
$$= 4.4 + 0.3 + 0.66$$
$$= 5.36\ m^2$$

Nov 13-12:26 PM

Page 38, Example 3:



S.A. "0" = 8 circles
$= 8(\pi r^2)$
$= 8[\pi(0.2^2)]$
$\doteq 8(0.1257)$
$\doteq 1.0056$
$\doteq 1\ m^2$

0 = Overlap

Total S.A. = (① + ② + ③) − overlaps
$\doteq (14.9 + 6.8 + 5.36) - 1$
$\doteq 27.06 - 1$
$\doteq 26.06$
$\doteq 26\ m^2$

Nov 13-12:26 PM

Page 39: Discuss the Ideas

1.

Oct 1-2:46 PM

CONCEPT REINFORCEMENT:

MMS9

PAGE 40: #3, 4 and 5

PAGE 41: #6 (count bottom), 8 (no bottom but have to paint overhang) and 9 (no bottoms)

PAGE 42: #10, 11 (no bottom) and 13

PAGE 43: #14 (no bottom) and 15 (the cylinder is solid, not hollow)

Oct 1-2:44 PM

3a) $A = 2\pi r^2 + 2\pi rh$

$A_{cylinder} = \pi r^2 + 2\pi rh$
$= \pi(1) + 2\pi(1)(4)$
$= \pi + 8\pi$
$= 9\pi \text{ cm}^2$

$A_{total} = 9\pi + 96 - \pi$
$= 8\pi + 96$
$= 25.13 + 96$
$= 121.13 \text{ cm}^2$

Box

$A_{sides} = 4 \times 4 \times 6 - \pi$
$= 96 - \pi \text{ cm}^2$

Nov 2-9:33 AM

TEST PREPARATION:
(Test Date: Tuesday, November 19, 2013)

MMS9
PAGE 12: #14
PAGE 18: #4 and 5
PAGE 21: #9
PAGE 31: #10
PAGE 40: #3a
PAGE 45: #3, 4, 5 and 6
PAGE 46: #15 and 16
as well as the extra practice question (2 triangular prisms attached by a cylinder)

(You should spend 30 min. per day on this between now and Tuesday, including Sat. and Sun.)

Nov 14-2:04 PM

PREPARATION FOR UNIT 1 TEST (Wednesday, October 13):

MMS9
PAGE 44: Read
PAGE 45: #4, 5, 6, and 8
PAGE 46: #11, 12, 13, 14, 15, and 16
PAGE 47: #17 and #19
PAGE 48: #1 to #6

Oct 1-3:03 PM