

## Curriculum Outcome

(N5) Determine the square root of positive rational numbers that are perfect squares.

(N6) Determine an approximate square root of positive rational numbers that are non-perfect squares.

(SS2) Determine the surface area of composite 3-D objects to solve problems

(N4) \*\*Explain and apply the order of operations, including exponents, with and without technology.\*\*

Extra Practice Worksheets  
-all 4 sheets

## Answer Keys

Lesson 1.1

1a)  $\frac{1}{3}$       b) 0.4

2) PS      b) PS      c) PS      d) not PS

3a)  $\frac{25}{49}$       b) 2.56      c) 0.8464      d)  $\frac{100}{81}$

4)  $\frac{15}{7}$       b)  $\frac{3}{5}$       c)  $\frac{20}{18}$       d)  $\frac{2}{7}$

5) a) 2.6      b) 18.1      c) 0.05      d) 0.15

6) a) 3.5m      b) 14m      c) 2.7m

Lesson 1.2

1a) Not PS      b) PS      c) Not PS      d) PS

2a) 5.2      b) 0.63

3a) 3.3      b) 0.62

4) 7.7

5a) 3.78      b) 1.37      c) 4.36      d) 0.84

6a) 17cm      b) 7.14m

Lesson 1.3

1a)  $88\text{cm}^2$     b)  $72\text{cm}^2$     c)  $144\text{cm}^2$     d)  $120\text{cm}^2$

2)  $11900\text{cm}^2$     3. a/b)  $6335\text{m}^2$     c)  $\$950.25$

Lesson 1.4

1a)  $996\text{cm}^2$     b)  $4200.4\text{cm}^2$

2)  $162\text{m}^2$

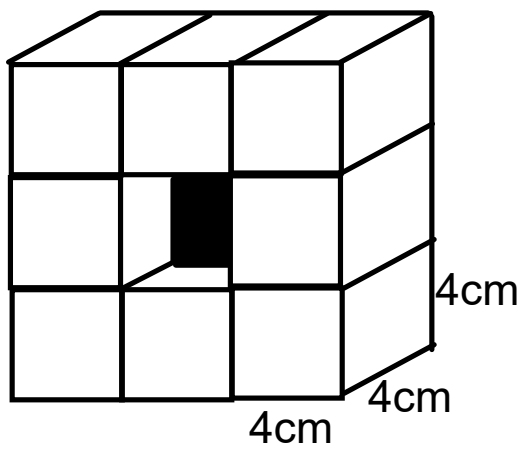
^

3a) The bottoms of the two triangular prisms would be subtracted. New surface area would be  $123\text{m}^2$

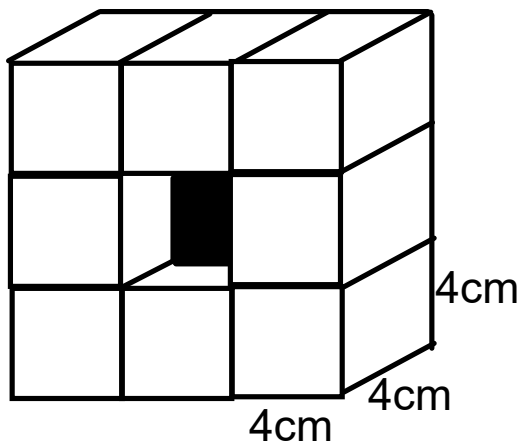
b)  $49\text{m}^2$

4)  $74.5\text{m}^2$

Calculate the surface area of the composite shape:



Calculate the surface area of the composite shape:



overlaps = 8

16faces

Area of one face

$$= 4 \times 4$$

$$= 16 \text{ cm}^2$$

8 cubes x 6 faces

= 48 faces - 16 faces

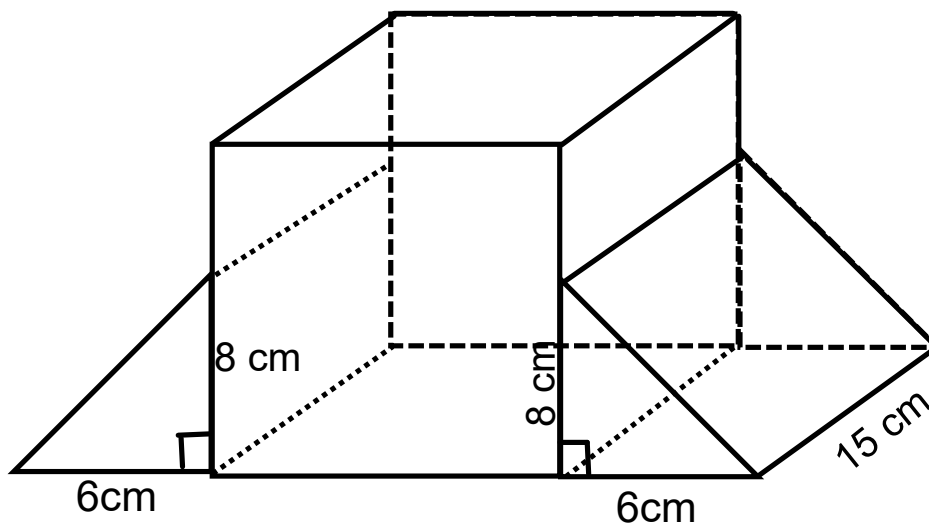
= 32 faces

x 16 cm<sup>2</sup>

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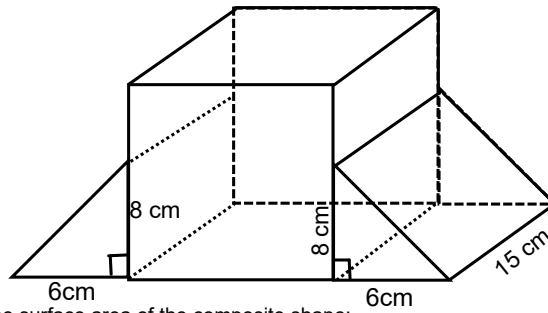
512 cm<sup>2</sup>

The rectangular prism is 12 cm by 10 cm by 15 cm



Calculate the surface area of the composite shape:

The rectangular prism is 12 cm by 10 cm by 15 cm



Calculate the surface area of the composite shape:

Rectangular Prism (12,10,15)

10	10	12	
$A = b \times h$	$A = b \times h$	$A = b \times h$	$Sa = 240 + 300 + 360$ $= 900 \text{ cm}^2$
$A = 10 \times 12$	$A = 10 \times 15$	$A = 12 \times 15$	
$A = 120$	$A = 150$	$A = 180$	
$2A = 240 \text{ cm}^2$	$2A = 300 \text{ cm}^2$	$2A = 360 \text{ cm}^2$	

$$c^2 = a^2 + b^2$$

$$c^2 = 8^2 + 6^2$$

$$c^2 = 64 + 36$$

$$c^2 = 100$$

$$c = 10$$

Triangular Prism

$A = \frac{b \times h}{2}$	$A = b \times h$	$A = b \times h$	$A = b \times h$
$A = \frac{6 \times 8}{2}$	$A = 15 \times 6$	$A = 8 \times 15$	$A = 10 \times 15$
$A = 24$	$A = 90$	$A = 120$	$A = 150$
$2A = 48$	$Sa = 48 + 90 + 120 + 150$ $= 408 \text{ cm}^2$		

Triangular Prism 2 Sa=408 cm<sup>2</sup>

$$Tsa = \text{Rec prism} + \text{tri Pris} + \text{tri Prism} - \text{overlaps}$$

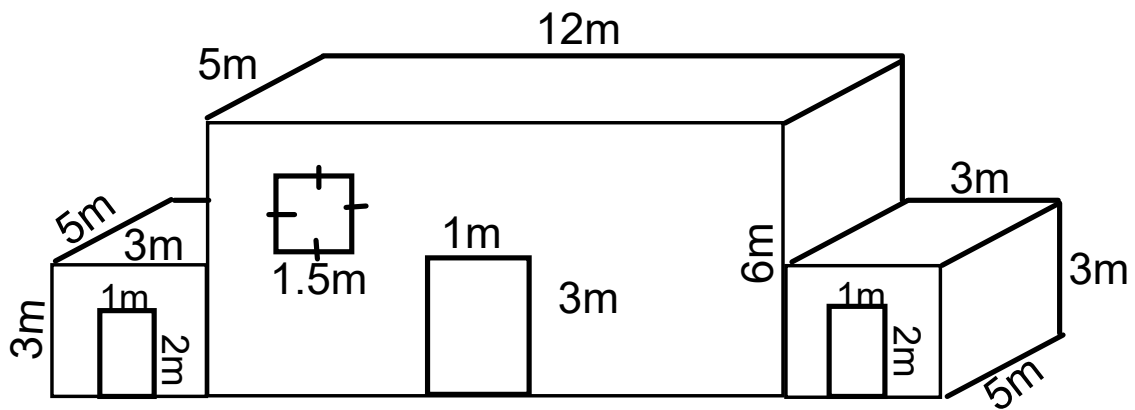
$$= 900 + 408 + 408 - 4(8 \times 15)$$

$$= 900 + 408 + 408 - 480$$

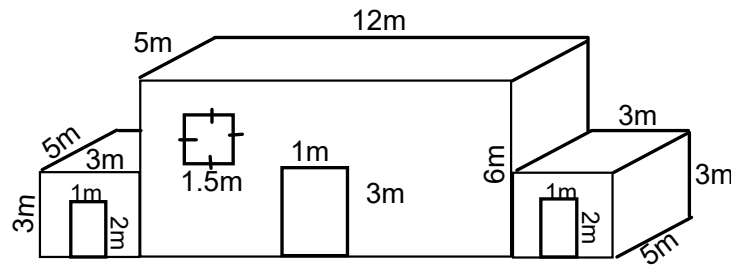
$$= 1236 \text{ cm}^2$$



Calculate the area of this WAREHOUSE



Calculate the area of this WAREHOUSE



Big Prism (5,12,6)

5	5	12	
$A = b \times h$ $A = 5 \times 12$ $A = 60$ $2A = 120 \text{ m}^2$	$A = b \times h$ $A = 6 \times 5$ $A = 30$ $2A = 60 \text{ m}^2$	$A = b \times h$ $A = 12 \times 6$ $A = 72$ $2A = 144 \text{ m}^2$	$Sa = 120 + 60 + 144$ $= 324 \text{ m}^2$

Small Prism (3,3,5)

5	5	3	
$A = b \times h$ $A = 5 \times 3$ $A = 15$ $2A = 30 \text{ m}^2$	$A = b \times h$ $A = 3 \times 5$ $A = 15$ $2A = 30 \text{ m}^2$	$A = b \times h$ $A = 3 \times 3$ $A = 9$ $2A = 18 \text{ m}^2$	$Sa = 30 + 30 + 18$ $= 78 \text{ m}^2$

Small Prism (3,3,5)     $Sa = 30 + 30 + 18$   
 $= 78 \text{ m}^2$

Window	door	door	door
$A = b \times h$	$A = b \times h$	$A = b \times h$	$A = b \times h$
$A = 1.5 \times 1.5$	$A = 1 \times 3$	$A = 1 \times 2$	$A = 1 \times 2$
$A = 2.25 \text{ m}^2$	$A = 3 \text{ m}^2$	$A = 2 \text{ m}^2$	$A = 2 \text{ m}^2$

Total window & doors =  $2.25 + 3 + 2 + 2$   
 $= 9.25 \text{ m}^2$

$Tsa = \text{Big} + \text{small} + \text{small-overlap} - \text{big roof} - \text{sm roof} - \text{sm roof} - \text{windows \& doors}$

$Tsa = \text{big} + \text{sm} + \text{sm ol} - \text{br} - \text{lr} - \text{lr} - \text{wd}$   
 $Tsa = 324 + 78 + 78 - 60 - 60 - 15 - 15 - 9.25$

$Tsa = 320.75 \text{ m}^2$

Class / Homework  
Review For Test

- Handout: Surface Area Worksheet

Questions: 1-6  
answers were on the board

- Questions from Textbook:

page 45 - 46

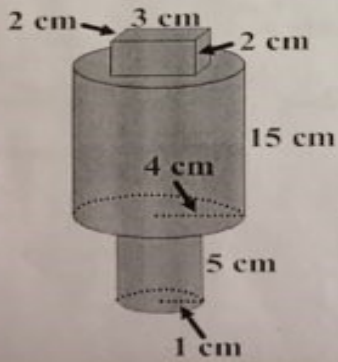
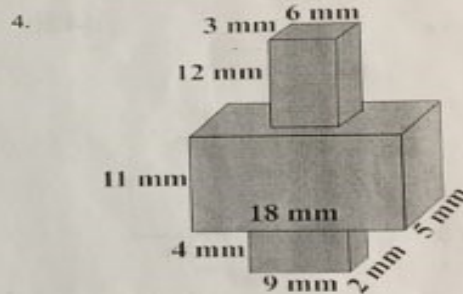
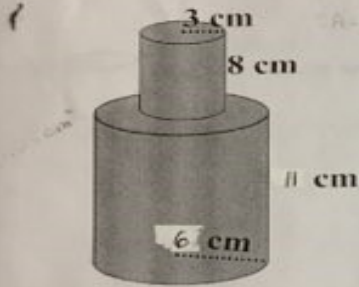
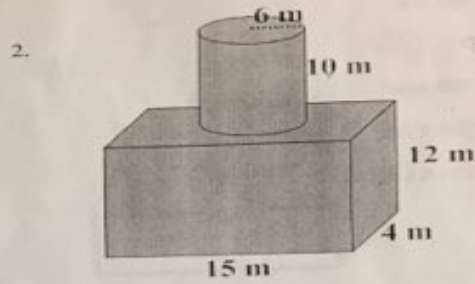
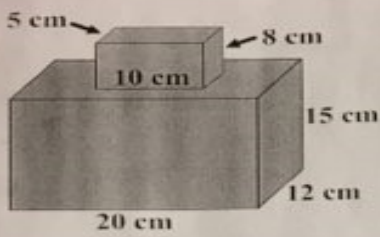
#2(b, d, f, h)	# 12ac
#3(a,b,c,d,e)	#13ab
#4(a,d)	#15(bc)
#5 (a, c, e)	#16(bc)
#6 (b,d)	#19(a)
# 7(ad)	

Page 48

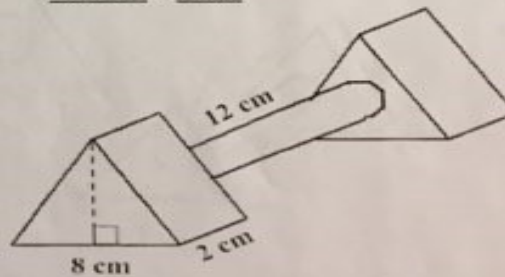
# 5 Warehouse question

**UNIT 3 ASSIGNMENT – SURFACE AREA OF COMPOSITE OBJECTS**

Determine the surface area of each composite object. Round answers to the nearest tenth, where necessary. Show ALL work on loose-leaf.

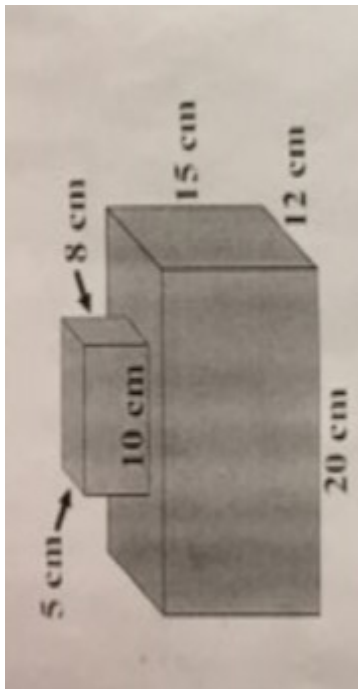


6. The cylinder below is connected to two **IDENTICAL EQUILATERAL TRIANGULAR** prisms. The cylinder's diameter is 10 cm.



**SOLUTIONS:**

1. 1680 cm<sup>2</sup>
2. 953.0 m<sup>2</sup>
3. 791.7 cm<sup>2</sup>
4. 990 mm<sup>2</sup>
5. 528.9 cm<sup>2</sup>
6. 426.8 cm<sup>2</sup>



Composite Objects Assignment

- ② Locate and Calculate Overlap
- ② Determine Total Surface Area

Small rectangular prism (5, 10, 8)

Front / Back	Side / Side	Top / Bottom
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 5 \times 10$	$= 5 \times 8$	$= 5 \times 10$
$= 50$	$= 40$	$= 50$
$\frac{\times 2}{100}$	$\frac{\times 2}{80}$	$\frac{\times 2}{100}$

$$SA = 160 + 80 + 100 = 340 \text{ cm}^2$$

Large rectangular prism (20, 12, 15)

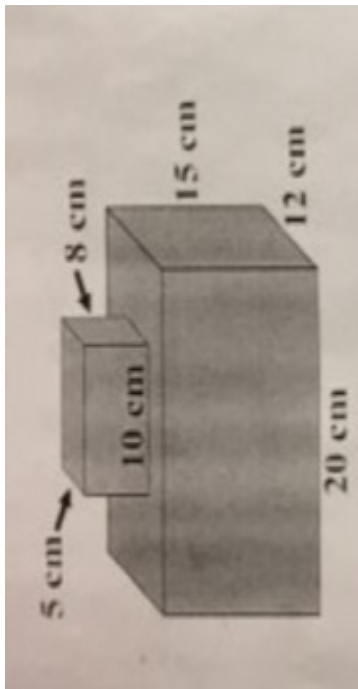
Front / Back	Side / Side	Top / Bottom
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 20 \times 15$	$= 12 \times 15$	$= 20 \times 12$
$= 300$	$= 180$	$= 240$
$\frac{\times 2}{600}$	$\frac{\times 2}{360}$	$\frac{\times 2}{480}$

$$SA = 600 + 360 + 480 = 1440 \text{ cm}^2$$

Overlap

$$A = L \times w = 10 \times 5 = 50 \times 2 = 100$$

$$\begin{aligned} \text{Total Surface Area} &= \text{Small} + \text{Large} - \text{Overlap} \\ &= 340 + 1440 - 100 \\ &= 1680 \text{ cm}^2 \end{aligned}$$



Composite Objects Assignment

- ② Locate and Calculate Overlap
- ② Determine Total Surface Area

Small rectangular prism (5, 10, 8)

Front / Back	Side / Side	Top / Bottom
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 8 \times 10$	$= 5 \times 8$	$= 5 \times 10$
$= 80$	$= 40$	$= 50$
$\frac{\times 2}{160}$	$\frac{\times 2}{80}$	$\frac{\times 2}{100}$

$$SA = 160 + 80 + 100 = 340 \text{ cm}^2$$

Large rectangular prism (20, 12, 15)

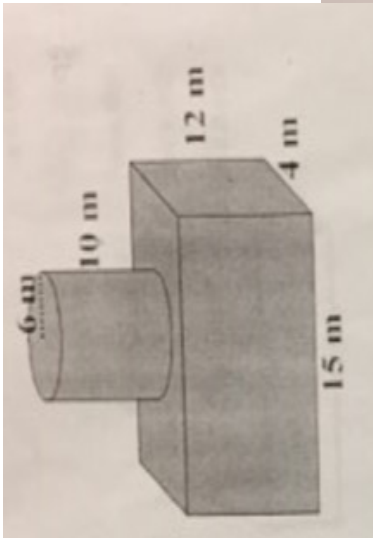
Front / Back	Side / Side	Top / Bottom
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 20 \times 15$	$= 12 \times 15$	$= 20 \times 12$
$= 300$	$= 180$	$= 240$
$\frac{\times 2}{600}$	$\frac{\times 2}{360}$	$\frac{\times 2}{480}$

$$SA = 600 + 360 + 480 = 1440 \text{ cm}^2$$

Overlap

$$A = L \times w = 10 \times 5 = 50 \times 2 = 100$$

$$\begin{aligned} \text{Total Surface Area} &= \text{Small} + \text{Large} - \text{Overlap} \\ &= 340 + 1440 - 100 \\ &= 1680 \text{ cm}^2 \end{aligned}$$



2. Cylinder

$$\begin{aligned}
 SA &= 2\pi r^2 + 2\pi rh \\
 &= 2(3.14)(6)^2 + 2(3.14)(6)(10) \\
 &= 2(3.14)(36) + 376.8 \\
 &= 226.08 + 376.8 \\
 &= 602.88 \text{ m}^2
 \end{aligned}$$

Rectangular Prism (15, 4, 12)

Front/Back

$$\begin{aligned}
 A &= L \times W \\
 &= 15 \times 4 \\
 &= 60 \\
 \hline
 &\quad \times 2 \\
 &= 120
 \end{aligned}$$

Side/Side

$$\begin{aligned}
 A &= L \times W \\
 &= 12 \times 4 \\
 &= 48 \\
 \hline
 &\quad \times 2 \\
 &= 96
 \end{aligned}$$

Top/Bottom

$$\begin{aligned}
 A &= L \times W \\
 &= 15 \times 12 \\
 &= 180 \\
 \hline
 &\quad \times 2 \\
 &= 360
 \end{aligned}$$

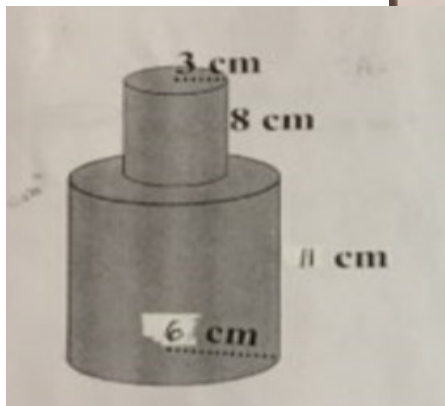
$$\begin{aligned}
 SA &= 120 \\
 &\quad 96 \\
 &\quad \hline
 &= 576 \text{ m}^2
 \end{aligned}$$

Overlap

$$\begin{aligned}
 A &= \pi r^2 \\
 &= (3.14)(6)^2 \\
 &= (3.14)(36) \\
 &= 113.04 \\
 \hline
 &\quad \times 2 \\
 &= 226.08 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Total Surface Area} &= \text{Cylinder} + \text{Rectangular Prism} - \text{Overlap} \\
 &= 602.88 + 576 - 226.08 \\
 &= 952.8 \text{ m}^2
 \end{aligned}$$





3) small cylinder

$$\begin{aligned}
 SA &= 2\pi r^2 + 2\pi r h \\
 &= 2(3.14)(3)^2 + 2(3.14)(3)(8) \\
 &= 56.52 + 150.72 \\
 &= 207.24 \text{ cm}^2
 \end{aligned}$$

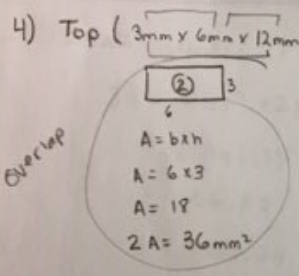
Big cylinder

$$\begin{aligned}
 SA &= 2\pi r^2 + 2\pi r h \\
 &= 2(3.14)(6)^2 + 2(3.14)(6)(11) \\
 &= 226.08 + 414.48 \\
 &= 640.56 \text{ cm}^2
 \end{aligned}$$

$$TSA = SA_1 + SA_2 - \text{overlap}$$

$$\begin{aligned}
 TSA &= 207.24 + 640.56 \text{ cm} - 56.52 \\
 &= 791.28
 \end{aligned}$$

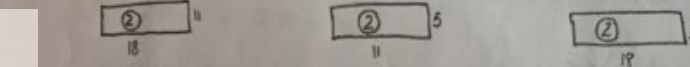
4) Top (3mm x 6mm x 12mm)



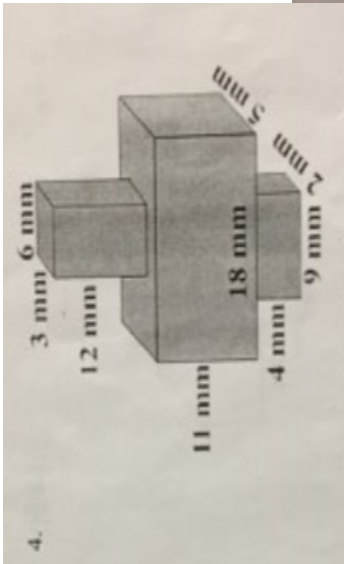
Overlap

$A = b \times h$ $A = 6 \times 3$ $A = 18$ $2A = 36 \text{ mm}^2$	$A = b \times h$ $A = 6 \times 12$ $A = 72$ $2A = 144 \text{ mm}^2$	$A = b \times h$ $A = 3 \times 12$ $A = 36 \text{ mm}^2$ $2A = 72 \text{ mm}^2$	$SA = 36 + 144 + 72$ $= 252 \text{ mm}^2$
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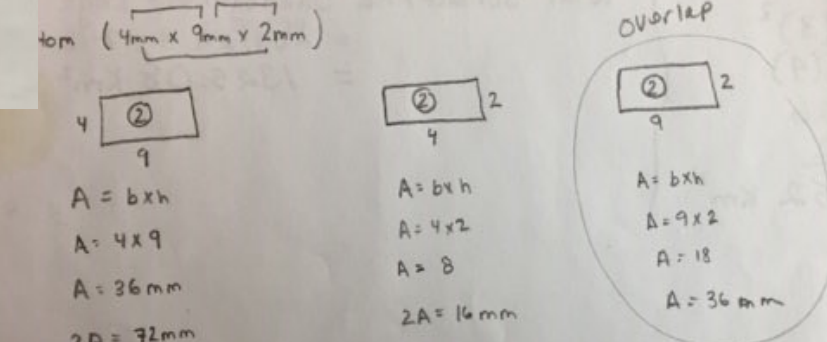
Middle (11mm x 18mm x 5mm)



$A = b \times h$ $A = 18 \times 11$ $A = 198$ $2A = 396 \text{ mm}^2$	$A = b \times h$ $A = 5 \times 11$ $A = 55$ $2A = 110 \text{ mm}^2$	$A = b \times h$ $A = 18 \times 5$ $A = 90 \text{ mm}^2$ $2A = 180 \text{ mm}^2$	$SA = 396 + 110 + 180$ $= 686 \text{ mm}^2$
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Bottom (4mm x 9mm x 2mm)



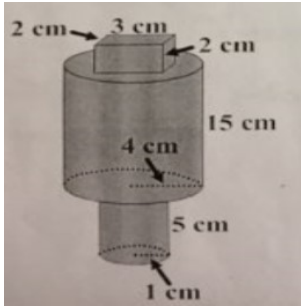
Overlap

$A = b \times h$ $A = 4 \times 9$ $A = 36 \text{ mm}^2$ $2A = 72 \text{ mm}^2$	$A = b \times h$ $A = 4 \times 2$ $A = 8$ $2A = 16 \text{ mm}^2$	$A = b \times h$ $A = 9 \times 2$ $A = 18$ $A = 36 \text{ mm}^2$	$SA = 32 + 36 + 18$ $= 124 \text{ mm}^2$
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$$TSA = 252 + 686 + 124 - 36 - 36$$

$$= 1062 - 72$$

$$= 990 \text{ mm}^2$$



5) Rectangle Prism  $(2 \times 3 \times 2)$   $A = b \times h$

$A = 2 \times 3$ $A = 6 \text{ cm}^2$ $2A = 12 \text{ cm}^2$	$A = 2 \times 3$ $A = 6 \text{ cm}^2$ $2A = 12 \text{ cm}^2$	$A = 2 \times 2$ $A = 4 \text{ cm}^2$ $2A = 8 \text{ cm}^2$
--	--	---

Overlap

$$SA_1 = 12 + 12 + 8$$

$$= 32 \text{ cm}^2$$

Middle cylinder

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

$$= 2(3.14)(4)^2 + 2(3.14)(4)(15)$$

$$= 100.48 + 376.8$$

$$SA_2 = 477.28 \text{ cm}^2$$

Small cylinder overlap

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

$$= 2(3.14)(1)^2 + 2(3.14)(1)(5)$$

$$= 6.28 + 31.4$$

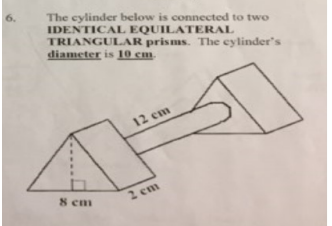
$$SA = 37.68$$

$$TSA = SA_1 + SA_2 + SA_3 - \text{overlaps} - \text{overlaps}$$

$$= 32 + 477.28 + 37.68 - 12 - 6.28$$

$$= 546.96 - 18.28$$

$$= 528.68 \text{ cm}^2$$



height

$$a^2 = c^2 - b^2$$

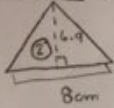
$$a^2 = 8^2 - 4^2$$

$$a^2 = 64 - 16$$

$$\sqrt{a^2} = \sqrt{48}$$

$$a = 6.9 \text{ cm}$$

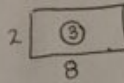
Triangular Prism



$$A = \frac{b \times h}{2}$$

$$A = \frac{8 \times 6.9}{2}$$

$$A = \frac{55.2}{2}$$



$$A = b \times h$$

$$A = 2 \times 8$$

$$A = 16 \text{ cm}^2$$

$$3A = 48 \text{ cm}^2$$

$$SA = 2 \text{ Triangles} + 3 \text{ rectangles}$$

$$= 55.2 \text{ cm}^2 + 48 \text{ cm}^2$$

$$SA = 103.2 \text{ cm}^2$$

There are 2 triangle prisms that are the exact same

$$A = 27.6 \text{ cm}^2$$

$$2A = 55.2 \text{ cm}^2$$

$$2SA = 206.4 \text{ cm}^2$$

Cylinder

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

$$SA = 2(3.14)(5)^2 + 2(3.14)(5)(12)$$

$$SA = 2(3.14)(25) + 2(3.14)(60)$$

$$SA = 157 + 376.8$$

$$SA = 533.8 \text{ cm}^2$$

overlap (4 circles)

$$A = \pi r^2$$

$$A = 3.14(5)^2$$

$$A = 3.14(25)$$

$$A = 78.5$$

$$4A = 314 \text{ cm}^2$$

$$TSA = 2 \text{ Triangle prisms} + \text{cylinder} - \text{overlap}$$

$$= 206.4 \text{ cm}^2 + 533.8 \text{ cm}^2 - 314 \text{ cm}^2$$

$$= 426.2 \text{ cm}^2$$

# Worksheet

## Answers

$$1) 1680 \text{ cm}^2$$

$$2) 952.8 \text{ mi}^2$$

$$3) 791.3 \text{ cm}^2$$

$$4) 990 \text{ mm}^2$$

$$5) 528.9 \text{ cm}^2$$

$$6) 426.8 \text{ cm}^2$$