

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.**

Homework Solutions

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4a) Area of a single face = 1 unit²

Of cubes = 3

Total number of faces = 6 x 3 = 18 faces

of overlaps = 2

of faces that disappear = 2(2) = 4

of visible faces = 18 - 4

= 14 Faces

x 1 unit²

Total SA = **14 unit²**

4b) Area of a single face = 1 unit²

Of cubes = 4

Total number of faces = 6 x 4 = 24faces

of overlaps = 3

of faces that disappear = 2(3) = 6

of visible faces = 24 - 6

= 18 Faces

x 1 unit²

Total SA = **18 unit²**

4c) Area of a single face = 1 unit²

Of cubes = 5

Total number of faces = 6 x 5 = 30faces

of overlaps = 4

of faces that disappear = 2(4) = 8

of visible faces = 30 - 8

= 22 Faces

x 1 unit²

Total SA = **22 unit²**

4d) Area of a single face = 1 unit²

Of cubes = 5

Total number of faces = 6 x 5 = 30faces

of overlaps = 5

of faces that disappear = 2(5) = 10

of visible faces = 30 - 10

= 20 Faces

x 1 unit²

Total SA = **20 unit²**

Homework Solutions
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4e) Area of a single face = 1 unit^2

of cubes = 5

Total number of faces = $5 \times 6 = 30 \text{ faces}$

of overlaps = 4

of faces that disappear = $2(4) = 8$

of visible faces = $30 - 8$

$$= 22 \text{ Faces}$$
$$\times 1 \text{ unit}^2$$

Total SA = 22 unit^2

4f) Area of a single face = 1 unit^2

of cubes = 6

Total number of faces = $6 \times 6 = 36 \text{ faces}$

of overlaps = 5

of faces that disappear = $2(5) = 10$

of visible faces = $36 - 10$

$$= 26 \text{ Faces}$$
$$\times 1 \text{ unit}^2$$

Total SA = 26 unit^2

5i) Area of a single face = 1 unit^2

of cubes = 5

Total number of faces = $6 \times 5 = 30 \text{ faces}$

Total Area of all cubes = $30 \text{ faces} \times (1 \text{ unit}^2)$
 $= 30 \text{ units}^2$

of overlaps = 5

of faces that disappear = $2(5) = 10$

area of disappearing faces = $10 \times 1 \text{ units}^2$
 $= 10 \text{ units}^2$

Total SA = $30 \text{ units}^2 - 10 \text{ units}^2$
 $= 20 \text{ units}^2$

5ii) Area of a single face = 1 unit^2

of cubes = 5

Total number of faces = $6 \times 5 = 30 \text{ faces}$

Total Area of all cubes = $30 \text{ faces} \times (1 \text{ unit}^2)$
 $= 30 \text{ units}^2$

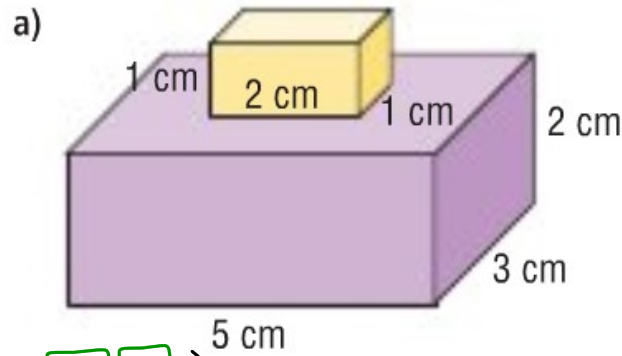
of overlaps = 5

of faces that disappear = $2(5) = 10$

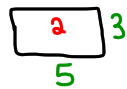
area of disappearing faces = $10 \times 1 \text{ units}^2$
 $= 10 \text{ units}^2$

Total SA = $30 \text{ units}^2 - 10 \text{ units}^2$
 $= 20 \text{ units}^2$

8a)



Big : $(5 \times 3 \times 2)$



$$A = b \times h$$

$$A = 5 \times 3$$

$$A = 15$$

$$2A = 30 \text{ cm}^2$$



$$A = b \times h$$

$$A = 3 \times 2$$

$$A = 6$$

$$2A = 12 \text{ cm}^2$$



$$A = b \times h$$

$$A = 5 \times 2$$

$$A = 10$$

$$2A = 20 \text{ cm}^2$$

$$SA = 30 + 12 + 20$$

$$SA = 62 \text{ cm}^2$$

small : $(1 \times 2 \times 1)$

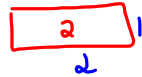


$$A = b \times h$$

$$A = 1 \times 2$$

$$A = 2$$

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



$$A = b \times h$$

$$A = 1 \times 2$$

$$A = 2$$

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



$$A = b \times h$$

$$A = 1 \times 1$$

$$A = 1$$

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

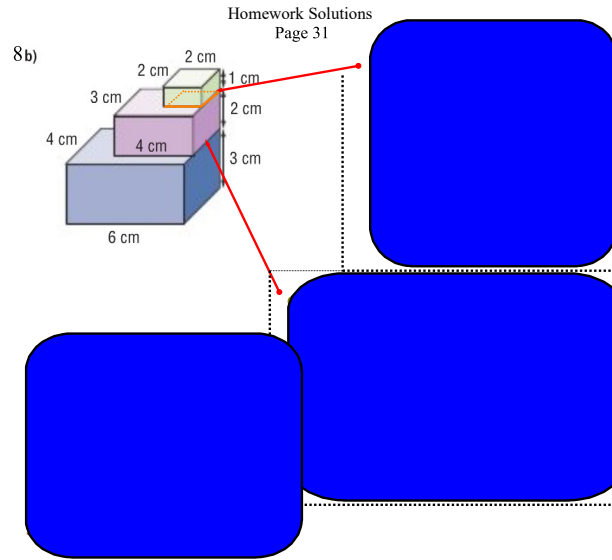
$$SA_2 = 4 + 4 + 2$$

$$= 10 \text{ cm}^2$$

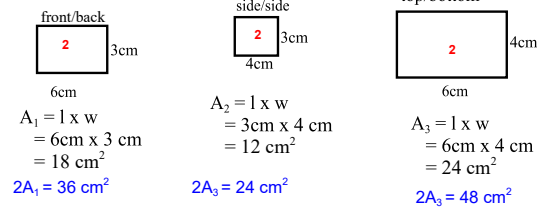
$$TSA = SA_1 + SA_2 - \text{overlap}$$

$$= 62 + 10 - 4$$

$$= 68 \text{ cm}^2$$

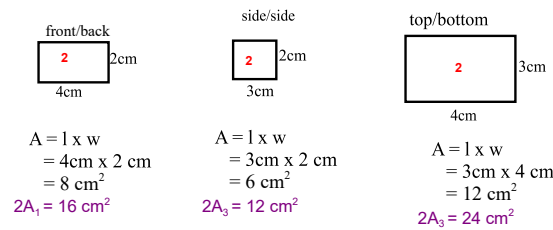


BIG Prism (if alone) BLUE



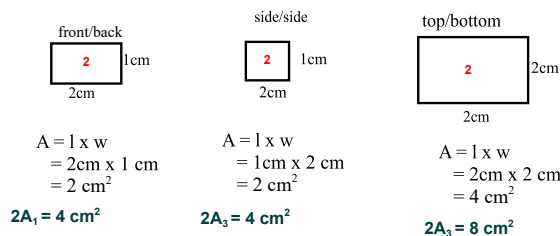
$$\begin{aligned} \text{Total SA of BIG} &= 2A_1 + 2A_2 + 2A_3 \\ &= 36\text{cm}^2 + 24\text{cm}^2 + 48\text{cm}^2 \\ &= 108\text{cm}^2 \end{aligned}$$

Middle Prism (if alone) Purple



$$\begin{aligned} \text{Total SA of Middle} &= 2A_1 + 2A_2 + 2A_3 \\ &= 16\text{cm}^2 + 12\text{cm}^2 + 24\text{cm}^2 \\ &= 52\text{cm}^2 \end{aligned}$$

Small Prism (if alone) ^{Green}



$$\begin{aligned} \text{Total SA of small} &= 2A_1 + 2A_2 + 2A_3 \\ &= 4\text{cm}^2 + 4\text{cm}^2 + 8\text{cm}^2 \\ &= 16\text{cm}^2 \end{aligned}$$

Surface area of object = Big area + Middle area + Small area - overlap1 - overlap2

$$\begin{aligned} &= 108\text{cm}^2 + 52\text{cm}^2 + 16\text{cm}^2 - 8\text{cm}^2 - 24\text{cm}^2 \\ &= 144\text{cm}^2 \end{aligned}$$

c)

Overlapped Faces
2 face involved

4

 3.5 cm
1.5 cm

Area of one face = $1.5\text{cm} \times 3.5\text{cm}$
= 5.25cm^2

BUT 4 faces involved for each overlap
THUS must multiply by 4 to get total overlapped area

**Area of overlap = $4(5.25\text{cm}^2)$
= 21cm^2**

BIG Prism (if alone) Purple

<p>front/back</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 6.5cm 2.5cm	<p>side/side</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 6.5cm 5.5cm	<p>top/bottom</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 5.5cm 2.5cm
$A = l \times w$ = $2.5\text{cm} \times 6.5\text{cm}$ = 16.25cm^2	$A = l \times w$ = $5.5\text{cm} \times 6.5\text{cm}$ = 35.75cm^2	$A = l \times w$ = $2.5\text{cm} \times 5.5\text{cm}$ = 13.75cm^2
$2A_1 = 32.5\text{cm}^2$	$2A_2 = 71.5\text{cm}^2$	$2A_3 = 27.5\text{cm}^2$

Total SA of BIG = $2A_1 + 2A_2 + 2A_3$
= $32.5\text{cm}^2 + 71.5\text{cm}^2 + 27.5\text{cm}^2$
= 131.5cm^2

Middle Prism (if alone) Brown

<p>front/back</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 5.5cm 2.5cm	<p>side/side</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 5.5cm 4.5cm	<p>top/bottom</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 4.5cm 2.5cm
$A = l \times w$ = $2.5\text{cm} \times 5.5\text{cm}$ = 13.75cm^2	$A = l \times w$ = $4.5\text{cm} \times 5.5\text{cm}$ = 24.75cm^2	$A = l \times w$ = $2.5\text{cm} \times 4.5\text{cm}$ = 11.25cm^2
$2A_1 = 27.5\text{cm}^2$	$2A_2 = 49.5\text{cm}^2$	$2A_3 = 22.5\text{cm}^2$

Total SA of Middle = $2A_1 + 2A_2 + 2A_3$
= $27.5\text{cm}^2 + 49.5\text{cm}^2 + 22.5\text{cm}^2$
= 99.5cm^2

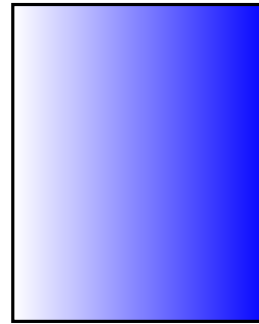
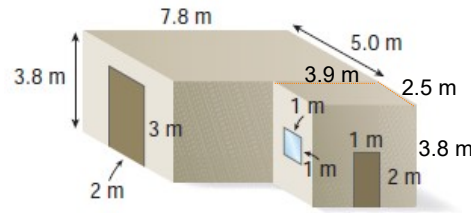
Small Prism (if alone) Brown

<p>front/back</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 3.5cm 1.5cm	<p>side/side</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 3.5cm 1.5cm	<p>top/bottom</p> <div style="border: 1px solid black; display: inline-block; padding: 2px;">2</div> 3.5cm 3.5cm
$A = l \times w$ = $1.5\text{cm} \times 3.5\text{cm}$ = 5.25cm^2	$A = l \times w$ = $4.5\text{cm} \times 5.5\text{cm}$ = 5.25cm^2	$A = l \times w$ = $2.5\text{cm} \times 4.5\text{cm}$ = 12.25cm^2
$2A_1 = 10.5\text{cm}^2$	$2A_2 = 10.5\text{cm}^2$	$2A_3 = 24.5\text{cm}^2$

Total SA of Middle = $2A_1 + 2A_2 + 2A_3$
= $10.5\text{cm}^2 + 10.5\text{cm}^2 + 24.5\text{cm}^2$
= 45.5cm^2

Surface area of object = Big area + Middle area + Small area - overlap area
= $131.5\text{cm}^2 + 99.5\text{cm}^2 + 45.5\text{cm}^2 - 21\text{cm}^2$
= 255.5cm^2

10) A garage has the dimension shown. The attached shed has the same height as the garage, but is one-half as long and one-half a width
 Remember you do not have to put anything on the floor



Step 1) Calculate the sides of all of the larger prism,

7.8, 3.8, 5

<p>roof:</p>	<p>left & right sides:</p>	<p>front & back side:</p>
$A_1 = l \times w$ $= 5 \text{ m} \times 7.8 \text{ m}$ $= 39 \text{ m}^2$ $2A_1 = 78 \text{ m}^2$	$A_2 = l \times w$ $= 5 \text{ m} \times 3.8 \text{ m}$ $= 19 \text{ m}^2$ $2A_2 = 38 \text{ m}^2$	$A_3 = l \times w$ $= 3.8 \text{ m} \times 7.8 \text{ m}$ $= 29.64 \text{ m}^2$ $2A_3 = 59.28 \text{ m}^2$

$$\begin{aligned} \text{Total SA of BIG} &= A_1 + 2A_2 + 2A_3 \\ &= 78 \text{ m}^2 + 38 \text{ m}^2 + 59.28 \text{ m}^2 \\ &= 175.28 \text{ m}^2 \end{aligned}$$

Step 2) Front building : dimensions 3.8 m x 2.5 m x 3.9 m

<p>roof:</p>	<p>front/back:</p>	<p>left side and right side:</p>
$A_1 = l \times w$ $= 3.9 \text{ m} \times 2.5 \text{ m}$ $= 9.75 \text{ m}^2$ $2A_1 = 19.5 \text{ m}^2$	$A_2 = l \times w$ $= 3.8 \text{ m} \times 3.9 \text{ m}$ $= 14.82 \text{ m}^2$ $2A_2 = 29.64 \text{ m}^2$	$A_3 = l \times w$ $= 2.5 \text{ m} \times 3.8 \text{ m}$ $= 9.5 \text{ m}^2$ $2A_3 = 19 \text{ m}^2$

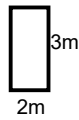
$$\begin{aligned} \text{Total SA of BIG} &= A_1 + 2A_2 + 2A_3 \\ &= 19.5 \text{ m}^2 + 29.64 \text{ m}^2 + 19 \text{ m}^2 \\ &= 68.14 \text{ m}^2 \end{aligned}$$

So surface area of the storage space with windows, doors & Floors:

$$\begin{aligned} \text{SA} &= \text{Big area} + \text{Small area} - \text{overlap area} - \text{floor} - \text{floor} - \text{window} \& \text{ doors} \\ &= 175.28 \text{ m}^2 + 68.14 \text{ m}^2 - 29.64 \text{ m}^2 - 39 \text{ m}^2 - 9.75 \text{ m}^2 - 9 \text{ m}^2 \\ &= 156.03 \text{ m}^2 \end{aligned}$$

- b) Vinyl siding costs $\$15/\text{m}^2$. The doors, windows, and roof will not be covered with siding. How much will it cost to cover this building with siding?

Door 1



$$\begin{aligned}A_1 &= l \times w \\ &= 2 \text{ m} \times 3 \text{ m} \\ &= 6 \text{ m}^2\end{aligned}$$

Door 2



$$\begin{aligned}A_2 &= l \times w \\ &= 2 \text{ m} \times 1 \text{ m} \\ &= 2 \text{ m}^2\end{aligned}$$

Window



$$\begin{aligned}A_3 &= l \times w \\ &= 1 \text{ m} \times 1 \text{ m} \\ &= 1 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Total area of window \& doors} &= A_1 + A_2 + A_3 \\ &= 6\text{m}^2 + 2\text{m}^2 + 1\text{m}^2 \\ &= 9 \text{ m}^2\end{aligned}$$

=

$$\begin{aligned}\text{Total area the Roofs} &= \text{Big Roof Area} + \text{Small Roof Area} \\ &= 39 \text{ m}^2 + 9.75 \text{ m}^2 \\ &= 48.75 \text{ m}^2\end{aligned}$$

area of building - area of roofs

$$\begin{aligned}&= 156.03 \text{ m}^2 - 39 \text{ m}^2 - 9.75 \text{ m}^2 \\ &= 107.28 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Total Price} &= 107.28 \text{ m}^2 \times 15/\text{m}^2 \\ &= \$1609.20\end{aligned}$$

Class/ Homework

Let's go over last night's homework

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Questions: 4

8abc

10

MUST SHOW ALL WORK