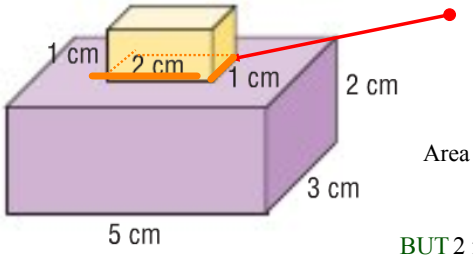
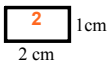
Homework Solutions
Page 31

8 a)



Overlapped Faces
2 face involved



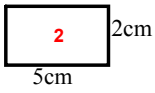
Area of one face = 2cm x 1cm
$= 2cm^2$

BUT 2 faces involved for each overlap
THUS must multiply by 2 to get total ovelapped area

Area of overlap $= 2(2cm^2)$
$= 4cm^2$

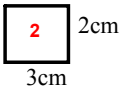
BIG Prism (if alone)

front/back



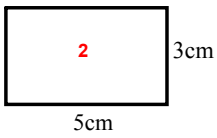
$A_1 = l \times w$
$= 5cm \times 2\ cm$
$= 10\ cm^2$
$2A_1 = 20\ cm^2$

side/side



$A_2 = l \times w$
$= 3cm \times 2\ cm$
$= 6\ cm^2$
$2A_3 = 12\ cm^2$

top/bottom

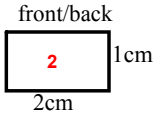


$A_3 = l \times w$
$= 3cm \times 5\ cm$
$= 15\ cm^2$
$2A_3 = 30\ cm^2$

Total SA of BIG $= 2A_1 + 2A_2 + 2A_3$
$= 20cm^2 + 12cm^2 + 30\ cm^2$
$= 62\ cm^2$

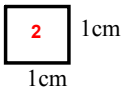
Small Prism (if alone)

front/back



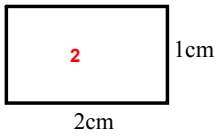
$A = l \times w$
$= 2cm \times 1\ cm$
$= 2\ cm^2$
$2A_1 = 4\ cm^2$

side/side



$A = l \times w$
$= 1cm \times 1\ cm$
$= 1\ cm^2$
$2A_2 = 2\ cm^2$

top/bottom



$A = l \times w$
$= 2cm \times 1\ cm$
$= 2\ cm^2$
$2A_3 = 4\ cm^2$

Total SA of Small $= 2A_1 + 2A_2 + 2A_3$
$= 4cm^2 + 2cm^2 + 4\ cm^2$
$= 10\ cm^2$

Area of overlap $= 2(2cm^2)$
$= 4cm^2$

Remember from above

Surface area of object = Big area + Small area - 2(overlap area)
$= 62\ cm^2 + 10\ cm^2 - 4\ cm^2$
$= 68\ cm^2$

Homework Solutions
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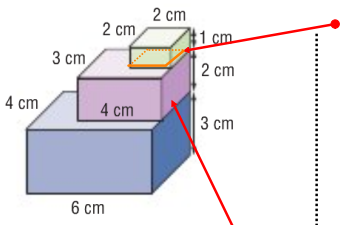
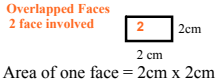
8b)



Overlapped Faces
2 face involved



Area of one face = 2cm x 2cm
= 4cm²

BUT 2 faces involved for each overlap
THUS must multiply by 2 to get total ovelapped area

Area of overlap 1 = 2(4cm²)
= 8cm²

Overlapped Faces
2 face involved

Area of one face = 4cm x 3cm
= 12cm²

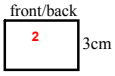
2 faces involved for each overlap
THUS must multiply by 2 to get total ovelap

Area of overlap 2 = 2(12cm²)
= 24cm²

THEN
sum of overlap area = **24 cm²** + **8 cm²**
= 32 cm²

BIG Prism (if alone) BLUE

front/back

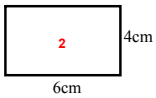


$A_1 = l \times w$
$= 6cm \times 3\ cm$
$= 18\ cm^2$
$2A_1 = 36\ cm^2$

side/side

$A_2 = l \times w$
$= 3cm \times 4\ cm$
$= 12\ cm^2$
$2A_3 = 24\ cm^2$

top/bottom

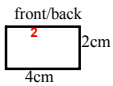


$A_3 = l \times w$
$= 6cm \times 4\ cm$
$= 24\ cm^2$
$2A_3 = 48\ cm^2$

Total SA of BIG $= 2A_1 + 2A_2 + 2A_3$
$= 36cm^2 + 24cm^2 + 48\ cm^2$
$= 108\ cm^2$

Middle Prism (if alone) Purple

front/back

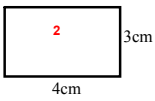


$A = l \times w$
$= 4cm \times 2\ cm$
$= 8\ cm^2$
$2A_1 = 16\ cm^2$

side/side

$A = l \times w$
$= 3cm \times 2\ cm$
$= 6\ cm^2$
$2A_3 = 12\ cm^2$

top/bottom



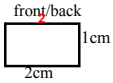
$A = l \times w$
$= 3cm \times 4\ cm$
$= 12\ cm^2$
$2A_3 = 24\ cm^2$

Total SA of Middle $= 2A_1 + 2A_2 + 2A_3$
$= 16cm^2 + 12cm^2 + 24\ cm^2$
$= 52\ cm^2$

Green

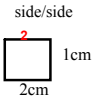
Small Prism (if alone)

front/back



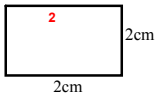
$A = l \times w$
$= 2cm \times 1\ cm$
$= 2\ cm^2$
$2A_1 = 4\ cm^2$

side/side



$A = l \times w$
$= 1cm \times 2\ cm$
$= 2\ cm^2$
$2A_3 = 4\ cm^2$

top/bottom

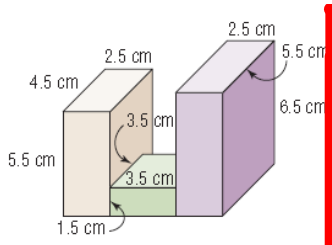


$A = l \times w$
$= 2cm \times 2\ cm$
$= 4\ cm^2$
$2A_3 = 8\ cm^2$

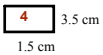
Total SA of small $= 2A_1 + 2A_2 + 2A_3$
$= 4cm^2 + 4cm^2 + 8\ cm^2$
$= 16\ cm^2$

Surface area of object = Big area + Middle area + Small area - overlap area
$= 108\ cm^2 + 52\ cm^2 + 16\ cm^2 - 32\ cm^2$
$= 144\ cm^2$

c)



Overlapped Faces
2 face involved



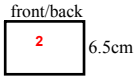
Area of one face = 1.5cm x 3.5cm
= 5.25cm^2

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

Area of overlap = 4(5.25cm^2)
= 21 cm^2

BIG Prism (if alone) Purple

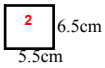
front/back



A = l x w
= 2.5cm x 6.5 cm
= 16.25 cm^2

$2A_1$ = 32.5 cm^2

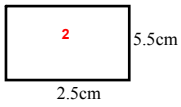
side/side



A = l x w
= 5.5cm x 6.5 cm
= 35.75 cm^2

$2A_3$ = 71.5 cm^2

top/bottom



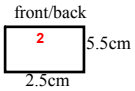
A = l x w
= 2.5cm x 5.5 cm
= 13.75 cm^2

$2A_3$ = 27.5 cm^2

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

Middle Prism (if alone)brown

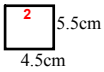
front/back



A = l x w
= 2.5cm x 5.5 cm
= 13.75 cm^2

$2A_1$ = 27.5 cm^2

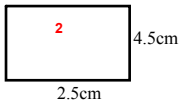
side/side



A = l x w
= 4.5cm x 5.5cm
= 24.75 cm^2

$2A_3$ = 49.5 cm^2

top/bottom



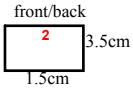
A = l x w
= 2.5cm x 4.5 cm
= 11.25 cm^2

$2A_3$ = 22.5 cm^2

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

Small Prism (if alone) green

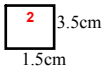
front/back



A = l x w
= 1.5cm x 3.5 cm
= 5.25 cm^2

$2A_1$ = 10.5 cm^2

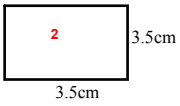
side/side



A = l x w
= 4.5cm x 5.5cm
= 5.25 cm^2

$2A_3$ = 10.5 cm^2

top/bottom



A = l x w
= 2.5cm x 4.5 cm
= 12.25 cm^2

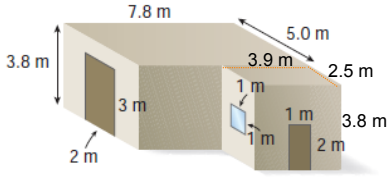
$2A_3$ = 24.5 cm^2

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

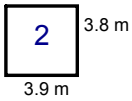
Surface area of object = Big area + Middle area + Small area - overlap area
= 131.5 cm^2 + 99.5 cm^2 + 45.5 cm^2 - 21 cm^2
= 255.5 cm^2

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



Overlap



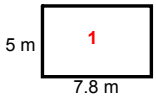
$A = l \times w$
$= 3.9\text{ m} \times 3.8\text{ m}$
$= 14.82\text{ m}^2$

BUT 2 faces involved for each overlap
THUS must multiply by 2 to get total overlapped area

$2A = 29.64\text{ m}^2$

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

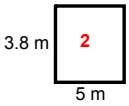
roof:



$A_1 = l \times w$
$= 5\text{ m} \times 7.8\text{ m}$
$= 39\text{ m}^2$

$A_1 = 39\text{ m}^2$

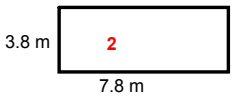
left & right sides:



$A_2 = l \times w$
$= 5\text{ m} \times 3.8\text{ m}$
$= 19\text{ m}^2$

$2A_2 = 38\text{ m}^2$

front & back side:



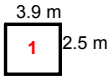
$A_3 = l \times w$
$= 3.8\text{ m} \times 7.8\text{ m}$
$= 29.64\text{ m}^2$

$2A_3 = 59.28\text{ m}^2$

Total SA of BIG $= A_1 + 2A_2 + 2A_3$
$= 39\text{ m}^2 + 38\text{ m}^2 + 59.28\text{ m}^2$
$= 136.28\text{ m}^2$

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

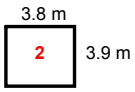
roof:



$A_1 = l \times w$
$= 3.9\text{ m} \times 2.5\text{ m}$
$= 9.75\text{ m}^2$

$A_1 = 9.75\text{ m}^2$

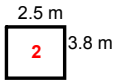
front/back:



$A_2 = l \times w$
$= 3.8\text{ m} \times 3.9\text{ m}$
$= 14.82\text{ m}^2$

$2A_2 = 29.64\text{ m}^2$

left side and right side:



$A_3 = l \times w$
$= 2.5\text{ m} \times 3.8\text{ m}$
$= 9.5\text{ m}^2$

$2A_3 = 19\text{ m}^2$

Total SA of BIG $= A_1 + 2A_2 + 2A_3$
$= 9.75\text{ m}^2 + 29.64\text{ m}^2 + 19\text{ m}^2$
$= 58.39\text{ m}^2$

So surface area of the storage space with windows and doors:

SA = Big area + Small area - overlap area
$= 136.28\text{ m}^2 + 58.39\text{ m}^2 - 29.64\text{ m}^2$
$= 165.03\text{ m}^2$