Warm Up Grade 8

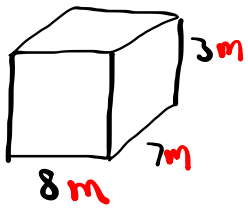
May 11, 2016

Whenever 3 dimensions are given, they are in the order: length, width and height.

Assessment Review

Sarah paints the walls of her bed room. The room measures 8 m by 7 m by 3 m. One can will cover 35 m^2.

a) How much paint should she buy if she needs to put 2 coats on the walls?



Top/Bottom ~~off~~ 7 × 8 Don't Paint

Side/Side 3 × 7 $A = l \times w = 7m \times 3m = 21m^2$

Front/Back 3 × 8 $A = l \times w = 8m \times 3m = 24m^2$

Area of Walls $= 2(21m^2 + 24m^2)$

$= 2(45m^2)$

$= 90m^2$

$\times$ 2nd coat of paint

$180m^2$

b) $180m^2 \div 35m^2$

$= 5.14$ cans So Buy 6 cans

Mental Math

1) 24 x 25

half ↓ ↓ Double

12 x 50

↓ ↓

6 x 100

$= 600$

2) 9.5 x 0.1

$9.5 \times \frac{1}{10}$

1 : 10

0.95

3) 5 x 13.6 x 20

with multiplication order doesn't matter

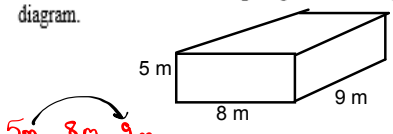
5 x 20 x 13.6

100 x 13.6

1360

PUT IN WORKSHEET ANSWERS

1. Find the surface area of a rectangular prism measuring 5 m by 8 m by 9 m. Include a diagram.



5m, 8m, 9m
Side

Front/Back
$A = b \times h$
$= 5 \times 8$
$= 40m^2$

Side/Side
$A = b \times h$
$= 8 \times 9$
$= 72m^2$

Top/Bottom
$A = b \times h$
$= 5 \times 9$
$= 45m^2$

Total SA $= 2$ (Front + Side + Top)
$= 2 (40m^2 + 72m^2 + 45m^2)$
$= 2 (157m^2)$
$= 314m^2$

2. Tracy made a stained-glass jewellery box.
It measured 20 cm by 12 cm by 8 cm.
a) About how much glass did Tracy use?
b) One piece of glass has an area of 100 cm^2 and costs $3.65.
How much did the glass cost?

Front/Back
$A = b \times h$
$= 20cm \times 12cm$
$= 240cm^2$

Side/Side
$A = b \times h$
$= 20 \times 8$
$= 160cm^2$

Top/Bottom
$A = b \times h$
$= 12cm \times 8cm$
$= 96 cm^2$

Total SA $= 2$ (Front + Side + Top)
$= 2 (240cm^2 + 160cm^2 + 96 cm^2)$
$= 2 (496 cm^2)$
$= 992 cm^2$

Tracy used $992cm^2$

b) $100cm^2$ for \$3.65

$992cm^2 \div 100cm^2 = 9.92$ pieces of glass

Need 10 pieces
$\times 3.65$
\$36.50

$\$3.65 \times 10$

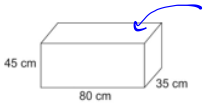
3. The surface area of a cube is 150 cm^2.
a) What is the area of one face of the cube?
b) What is the length of one edge of the cube?

a) Cube has 6 equal faces
Area of one face
$150cm^2 \div 6 = 25cm^2$

b) length
$A = b \times h$
$= b^2$ for cube

edge $= \sqrt{b^2} = \sqrt{\text{area of one face}}$
$= \sqrt{25 cm^2}$
$= 5cm$

4. An open aquarium measures 80 cm by 35 cm by 45 cm.
What is the surface area of the aquarium?



top not needed

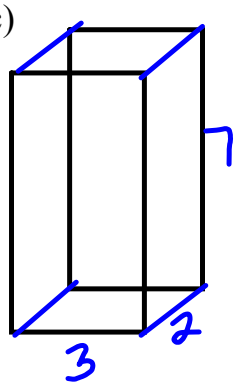
Front/Back
$A = b \times h$
$= 80cm \times 45cm$
$= 3600cm^2$

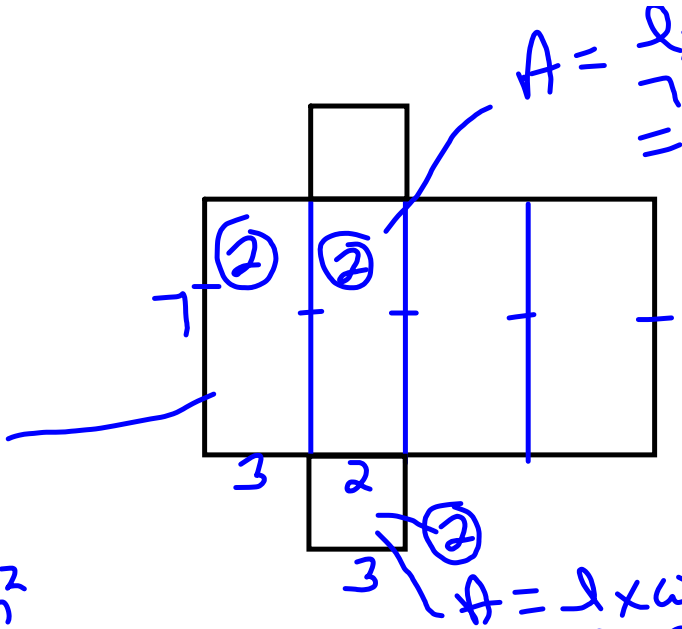
Side/Side
$A = b \times h$
$= 35 \times 45$
$= 1575$

Bottom
$A = b \times h$
$= 80cm \times 35cm$
$= 2800cm^2$

Total SA $= 2$ front $+ 2$ side $+$ Bottom
$= (2 \times 3600) + 2(1575) + 2800$
$= 7200 + 3150 + 2800$
$= 13150 cm^2$

6c)



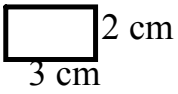


A = l x w
= 7 x 3
= 21 cm²

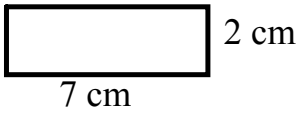
SA = 2x21 + 2x14 + 2x6
= 42 + 28 + 12
= 82 cm²

top/bottom

side/side



front/back



A = l x w
= 7 cm x 3 cm
= 21 cm²

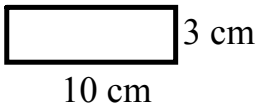
A = l x w
= 2 cm x 3 cm
= 6 cm²

A = l x w
= 2 cm x 7 cm
= 14 cm²

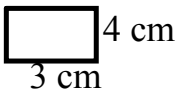
Total SA = 2 (Top) + 2 (Side) + 2 (Front)
= 2 (21 cm²) + 2 (6 cm²) + 2 (14 cm²)
= 42 cm² + 12 cm² + 28 cm²
= 82 cm²

7a)

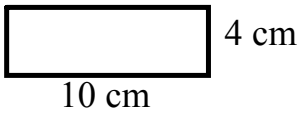
top/bottom



side/side



front/back



A = l x w
= 10 cm x 3 cm
= 30 m^2

A = l x w
= 4 cm x 3 cm
= 12 m^2

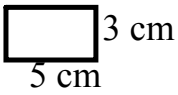
A = l x w
= 10 cm x 4 cm
= 40 m^2

Total SA = 2 (Top) + 2 (Side) + 2 (Front)
= 2 (30 m^2) + 2 (12 m^2) + 2 (40 m^2)
= 60 m^2 + 24 m^2 + 80 m^2
= 164 m^2

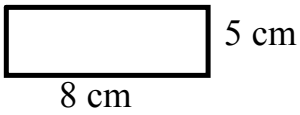
7b)

top/bottom

side/side



front/back



A = l x w
= 8 cm x 3 cm
= 24 cm^2

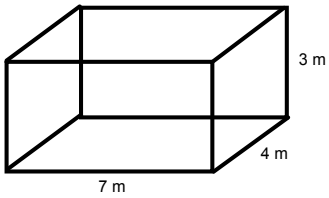
A = l x w
= 5 cm x 3 cm
= 15 cm^2

A = l x w
= 5 cm x 8 cm
= 40 cm^2

Total SA = 2 (Top) + 2 (Side) + 2 (Front)
= 2 (24 cm^2) + 2 (15 cm^2) + 2 (40 cm^2)
= 48 cm^2 + 30 cm^2 + 80 cm^2
= 158 cm^2

Whenever 3 dimensions are given, they are in the order: length, width and height.

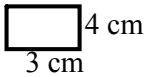
9)



The walls are being painted.

b) Assume you don't include ceiling and floor

side/side



front/back

$A = l \times w$

$= 4 \text{ cm} \times 3 \text{ cm}$

$= 12 \text{ m}^2$

$A = l \times w$

$= 7 \text{ cm} \times 3 \text{ cm}$

$= 21 \text{ m}^2$

Total SA Walls = 2 (Side) + 2 (Front)

$= 2 (12 \text{ m}^2) + 2 (21 \text{ m}^2)$

$= 24 \text{ m}^2 + 42 \text{ m}^2$

$= 66 \text{ m}^2$

Need 2 coats so need to cover twice the area $= 2 \times 66 \text{ m}^2$

$= 132 \text{ m}^2$

1 can covers 40 m^2

$132 / 40 = 3.3$ cans

Need to buy 4 cans

10) All 6 sides of a cube have equal area so

a) Area of one face of a cube = $54 \text{ cm}^2 / 6$

$= 9 \text{ cm}^2$

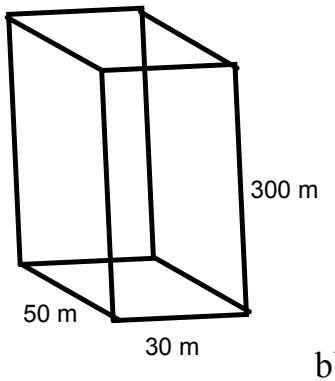
b) Area of square = 9 cm^2

side = $\sqrt{9}$

side = 3 cm

Whenever 3 dimensions are given, they are in the order: length, width and height.

11)



b) Assume you don't include ceiling and floor

side/side

A = l x w

= 30 cm x 300 cm

= 9000 m^2

front/back

A = l x w

= 300 cm x 50cm

=15000 m^2

Total SA Walls = 2 (Side) + 2 (Front)

= 2 (9000 m^2) + 2 (15000 m^2)

= 18000 m^2 + 30000 m^2

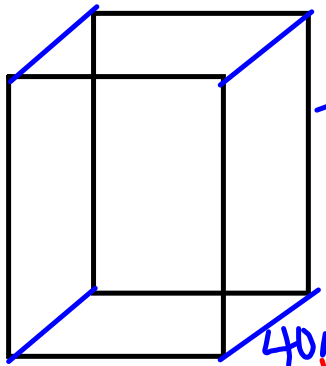
= 48 000 m^2

Only 1/4 are windows

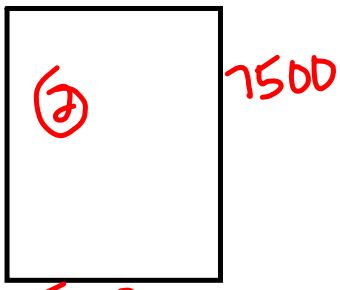
$\frac{48\ 000\ m^2}{4}$ = 12 000 m^2

12)

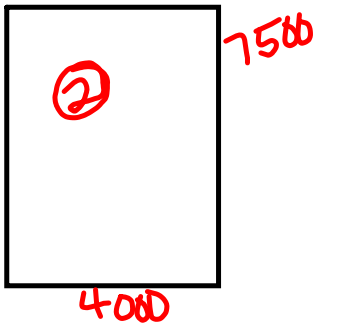
12.



Find area of 4 walls.



$A = l \times w$
$= 7500 \times 5000$
$= 375\,000\,000\ cm^2$



$A = l \times w$
$= 7500 \times 4000$
$= 300\,000\,000\ cm^2$

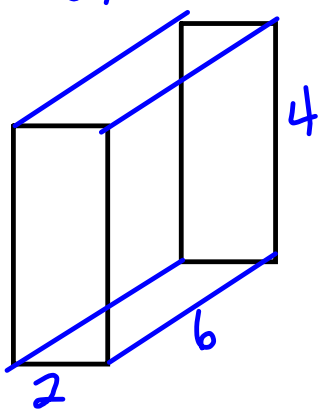
Total Area $= 2 \times 375\,000\,000 + 2 \times 300\,000\,000$
$= 750\,000\,000 + 600\,000\,000$
$= 1\,350\,000\,000\ cm^2$

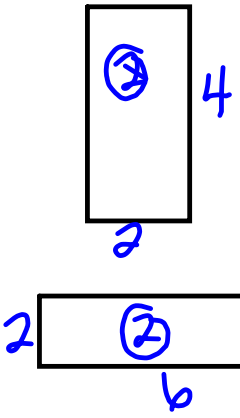
1 Euro per month for every $50\ cm^2$

$$\frac{1\,350\,000\,000}{50}$$

27 000 000 Euros per month for advertising

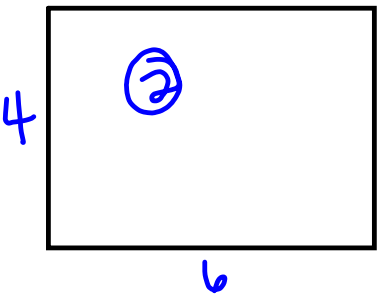
13 a)





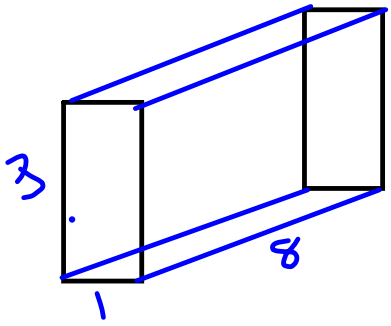
$A = l \times w$
$= 4 \times 2$
$= 8\ cm^2$

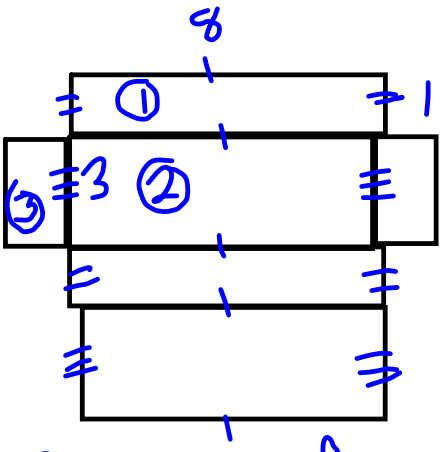
$A = l \times w$
$= 6 \times 2$
$= 12\ cm^2$



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

$SA = 2 \times 8 + 2 \times 12 + 2 \times 24$
$= 16 + 24 + 48$
$= 88\ cm^2$





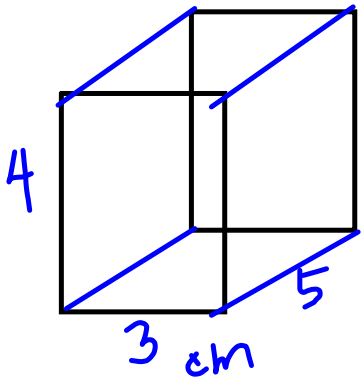
$A_① = l \times w$
$= 8 \times 1$
$= 8\ cm^2$

$A_② = l \times w$
$= 8 \times 3$
$= 24\ cm^2$

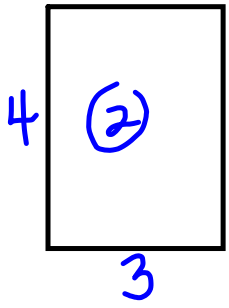
$A_③ = l \times w$
$= 3 \times 1$
$= 3\ cm^2$

$SA = 2 \times 8 + 2 \times 24 + 2 \times 3$
$= 16 + 48 + 6$
$= 70\ cm^2$

c)

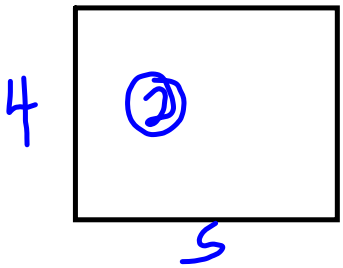


Front & Back



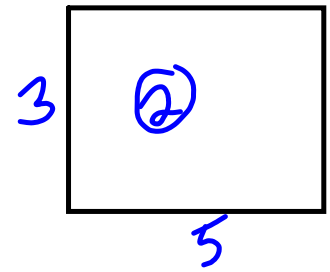
$A = l \times w$
$= 4 \times 3$
$= 12 cm^2$

Sides



$A = l \times w$
$= 4 \times 5$
$= 20 cm^2$

Top and Bottom



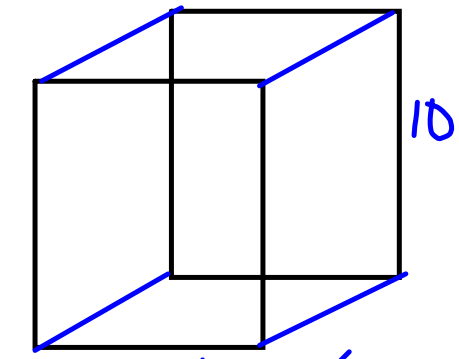
$A = l \times w$
$= 5 \times 3$
$= 15 cm^2$

$SA = 2 \times 12 + 2 \times 20 + 2 \times 15$
$= 24 + 40 + 30$
$= 94 cm^2$

Greatest SA $3 \times 4 \times 5$ Prism R

Least SA $1 \times 3 \times 8$ Prism Q

14.



A - Top & Bottom
$= 2 \times 5 = 10$
A - Sides
$10 \times 5 = 50$
A Front & Back
$10 \times 2 = 20$

$SA = 2 \times 10 + 2 \times 50 + 2 \times 20$
$= 20 + 100 + 40$
$= 160 cm^2$

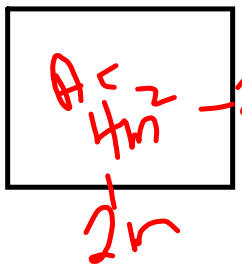
a) Double the length $\rightarrow$ 4cm
Area of sides stayed the same $\rightarrow$ 50cm²
Top & Bottom $\rightarrow 4 \times 5 = 20 cm^2$
Front & Back $\rightarrow 4 \times 10 = 40 cm^2$
$SA = 2 \times 50 + 2 \times 20 + 2 \times 40$
$= 100 + 40 + 80 = 220 cm^2$

b) Half the length
Area of Sides $\rightarrow$ same $50 cm^2$
T & B $\rightarrow 1 \times 5 = 5 cm^2$
F & B $\rightarrow 1 \times 10 = 10 cm^2$

$SA = 2 \times 50 + 2 \times 5 + 2 \times 10$
$= 100 + 10 + 20$
$= 130 cm^2$

16. Square Base $4m^2$

Surface Area $48m^2$



Both bases $\rightarrow 8m^2$

4 sides $\rightarrow$ have an area $40m^2$ $(48-8)$

One of lengths 2cm

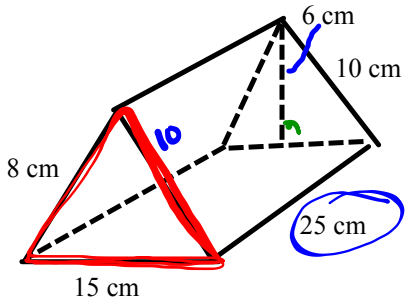
Each of rectangles is the same,

so area of each rectangle $\frac{40}{4} = 10cm^2$

$2 \times 5 = 10$

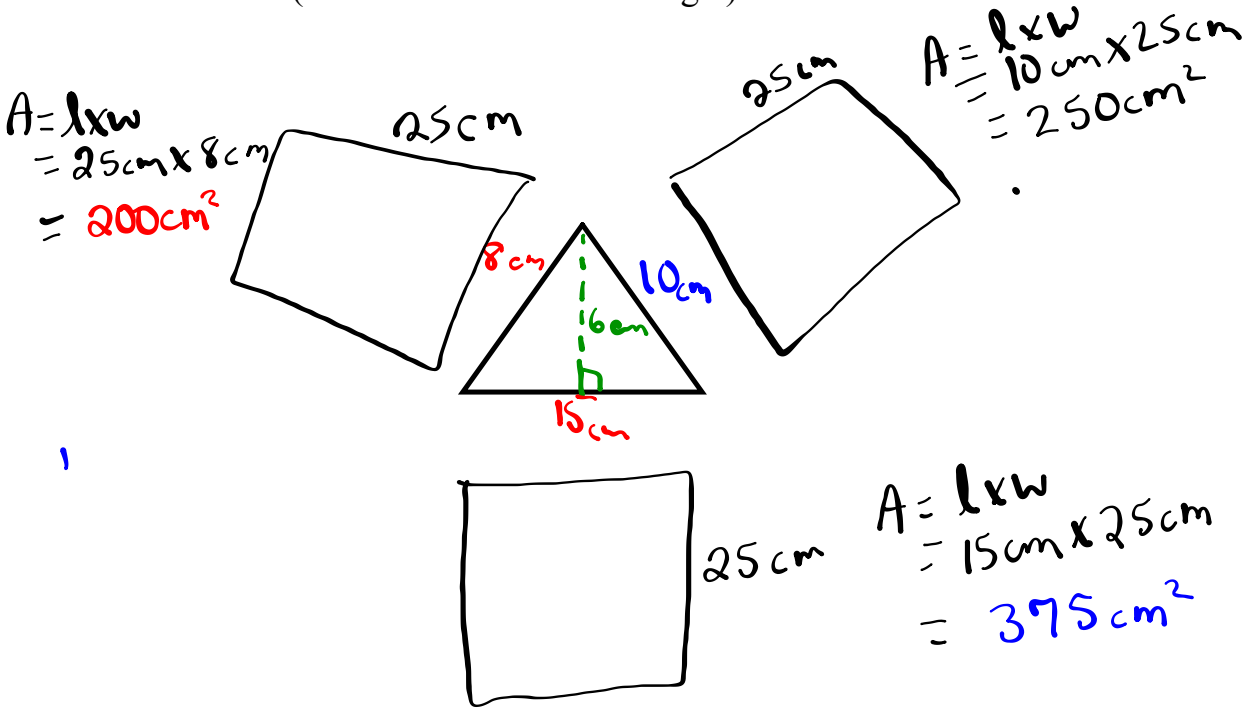
Dimensions $2 \times 2 \times 5$

Surface Area of Triangular Prism



The Surface Area of a Triangular Prism=
areas of the 3 rectangular faces + 2 (the area of the triangular bases)

Sketch the faces (HINT start with the Triangle)



$A_\Delta = \frac{b \times h}{2}$

$= \frac{15_{cm} \times 6_{cm}}{2}$

$= \frac{90\,cm^2}{2}$

$= 45cm^2$

Total S.A. Δ Prism

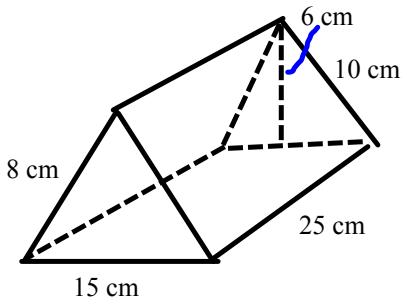
$= 2\Delta$ + Rec + Rec + Rec

$= 2(45cm^2) + 375cm^2 + 400cm^2 + 250cm^2$

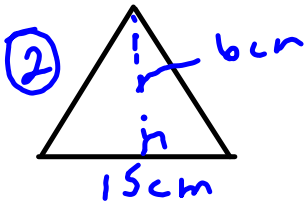
$= 90cm^2 + 375cm^2 + 400cm^2 + 250cm^2$

$= 1115\,cm^2$

Surface Area of Triangular Prism



Front and Back



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

$= \frac{15 \times 6}{2}$

$= \frac{90}{2}$

$= 45\ cm^2$

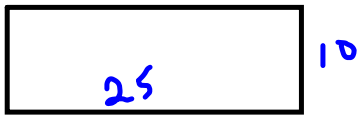
Bottom

$A = l \times w$

$= 25 \times 15$

$= 375\ cm^2$

Side

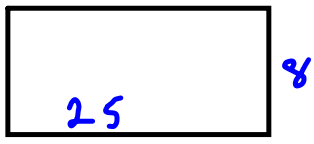


$A = l \times w$

$= 25 \times 10$

$= 250\ cm^2$

Side



$A = l \times w$

$= 25 \times 8$

$= 200\ cm^2$

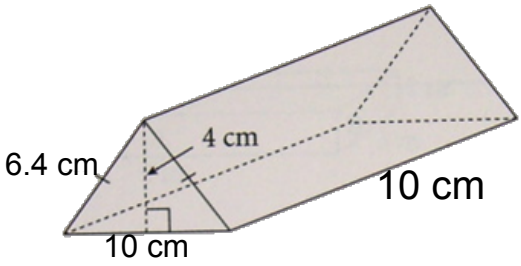
$SA = 2 \times 45 + 375 + 250 + 200$

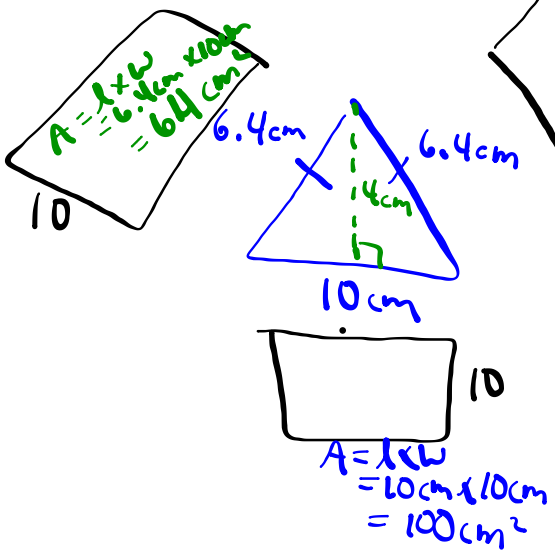
$= 90 + 375 + 250 + 200$

$= 915\ cm^2$

The Surface Area of a Triangular Prism equals the sum of the areas of the 3 rectangular faces + 2 x the area of the triangular bases.

Sketch a net of this right triangular prism.
What is its surface area?





$A_\Delta = \frac{b \times h}{2}$

$= \frac{10\text{cm} \times 4\text{cm}}{2}$

$= \frac{40\text{cm}^2}{2}$

$= 20\text{cm}^2$

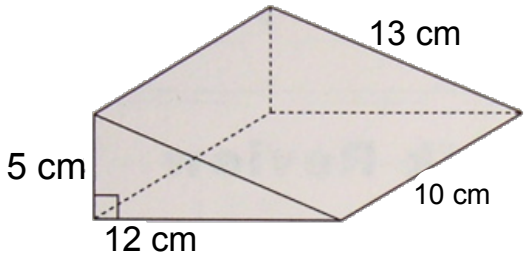
Total S.A = $2\Delta + Rec + Rec + Rec$

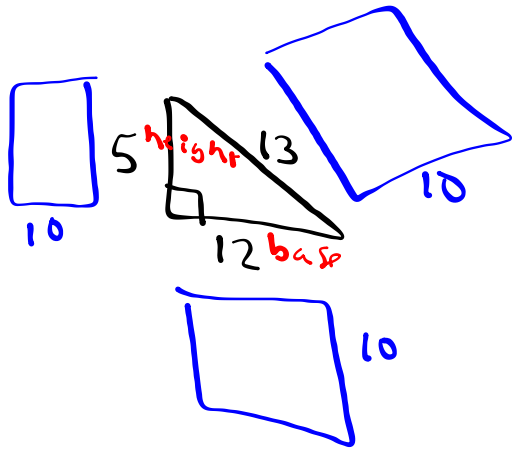
$= 2(20\text{cm}^2) + 100\text{cm}^2 + 64\text{cm}^2 + 64\text{cm}^2$

$= 40\text{cm}^2 + 100\text{cm}^2 + 64\text{cm}^2 + 64\text{cm}^2$

$= 268\text{cm}^2$

Sketch a net of this right triangular prism.
What is its surface area?





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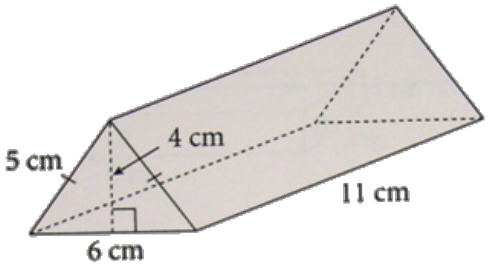
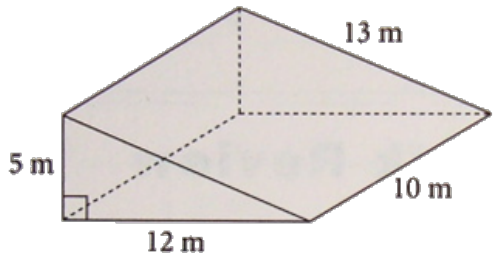
#8 a,b,c,d, #9,b,c, #13

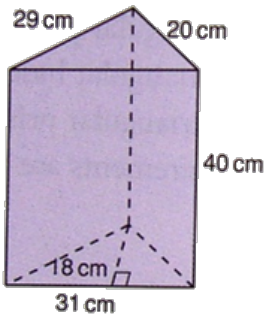
Sketch a net of this right triangular prism.
What is its surface area?



Sketch a net of this right triangular prism.
What is its surface area?



Sketch a net of this right triangular prism.
What is its surface area?



Attachments

Review of Surface area of 2D Shape Grade 8 Unit 4 PDF.pdf