Math 8

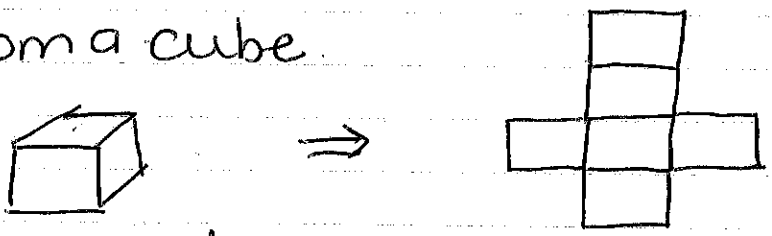
Chapter 4 notes

4.1 Exploring Nets

→ 4.3 Surface Area

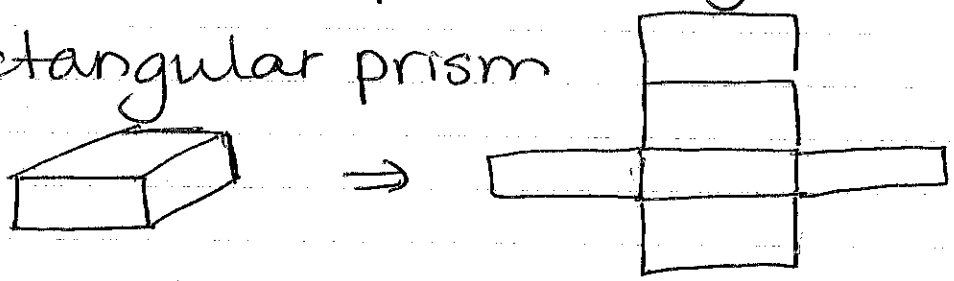
A net is the broken down pieces of a 3-D object.

ex from a cube

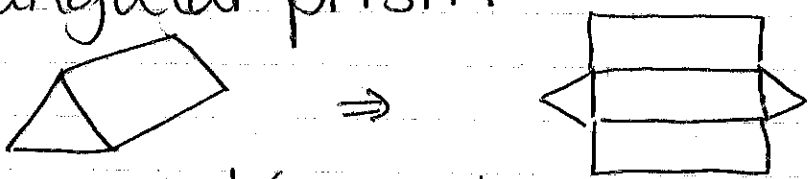


* just pretend you could use scissors to cut it apart & lay it down flat.

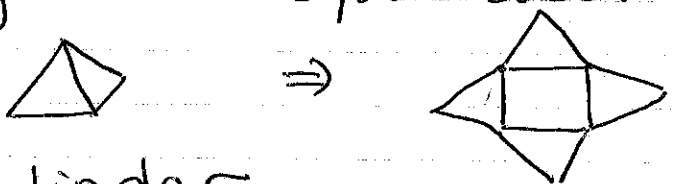
rectangular prism



triangular prism



pyramid (square base)



cylinder

A net is helpful because we can take a 3-D object & break it up into parts to find the total area

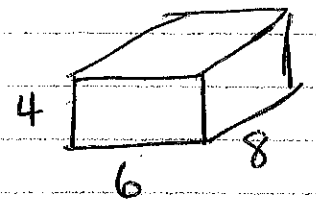
* Remember

Area: $\square = l \times w$

$\triangle = \frac{b \times h}{2}$ (b = base, h = height)

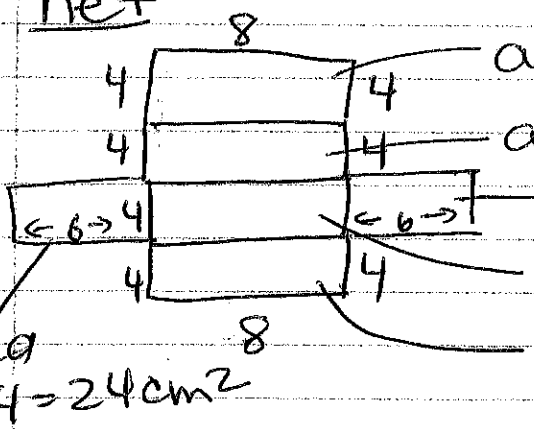
$\bigcirc = \pi r^2$ (r = radius)

So if we have a 3-D shape:



⇒ we can find the total surface area by drawing the net & adding all areas

Net



area = l × w = 8 × 4 = 32 cm²

area = 8 × 4 = 32 cm²

area = 6 × 4 = 24 cm²

area = 8 × 4 = 32 cm²

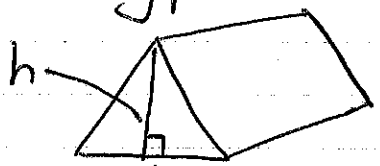
area = 8 × 4 = 32 cm²

Now add all areas:

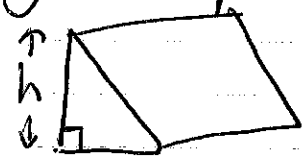
32 + 32 + 24 + 32 + 32 + 24 = 176 cm

4.4 Surface Area of a Right Triangular Prism

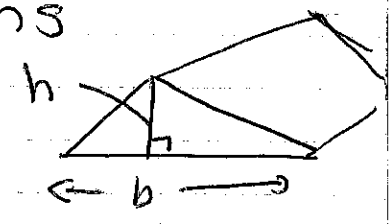
2 types of triangular prisms



equalateral



right angle

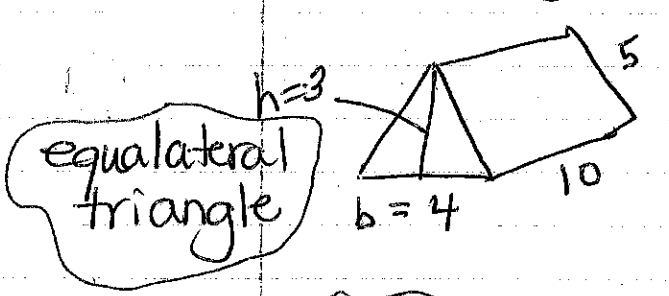


Scalene

Remember:

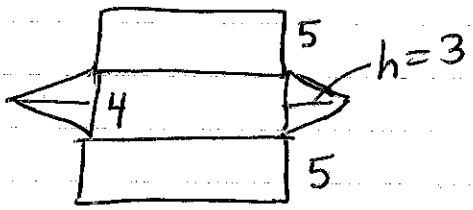
Area $\triangle$ (h, b) or $\triangle$ (h, b) $= \frac{b \times h}{2}$

Area $\square$ (w, l) $= l \times w$



equalateral triangle

$\Rightarrow$ net

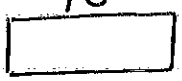


Area of trianges $= \frac{b \times h}{2}$

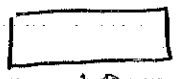
$= \frac{4 \times 3}{2} = 6$

Area of rectangles

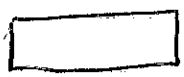
10



$5 = l \times w = 5 \times 10 = 50$



$4 = 4 \times 10 = 40$



$5 = 5 \times 10 = 50$

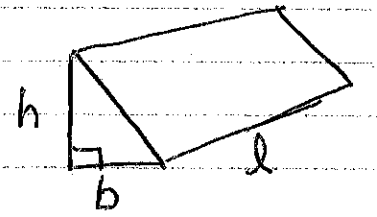
* there are 2 triangles so muliply by 2

$A_{\triangle} = 6 \times 2 = 12$

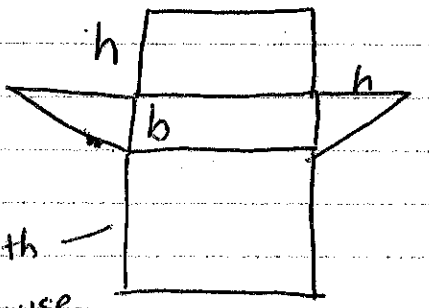
Now add them all together

$SA = 50 + 40 + 50 + 12 = 152$

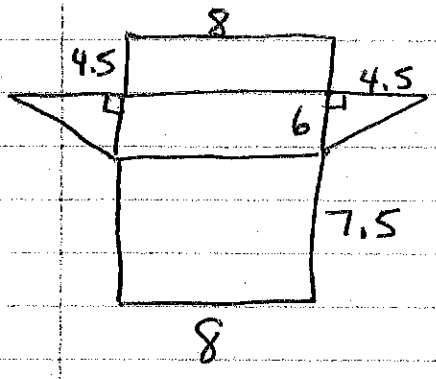
right angle triangle

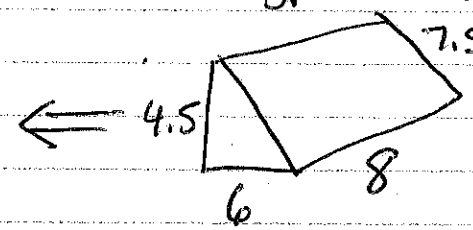


⇒ net



* net w values

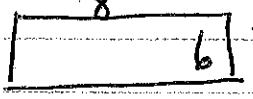




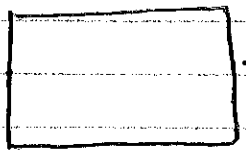
$\text{Area}_{\triangle} = \frac{b \times h}{2} = \frac{6 \times 4.5}{2} = 13.5$

* 2 triangles $13.5 \times 2 = 27$

Area = l x w = 8 x 4.5 = 36



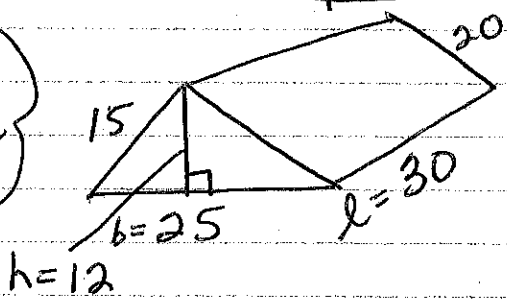
A = 8 x 6 = 48



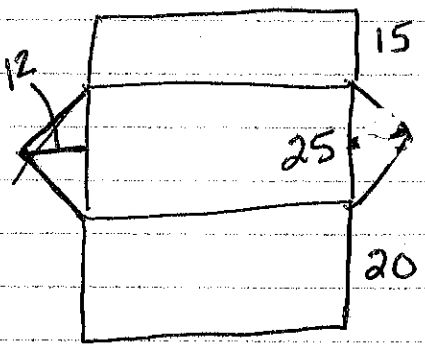
A = 8 x 7.5 = 60

Add together = 171

Scalene triangle



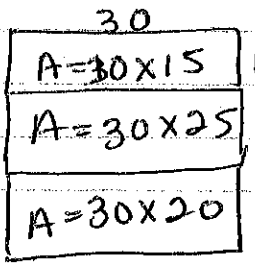
⇒ net



Area 2 triangles = $\frac{b \times h}{2} = \frac{25 \times 12}{2} = 150$

2 triangles $150 \times 2 = 300$

Add all rectangle areas = 2100



=450

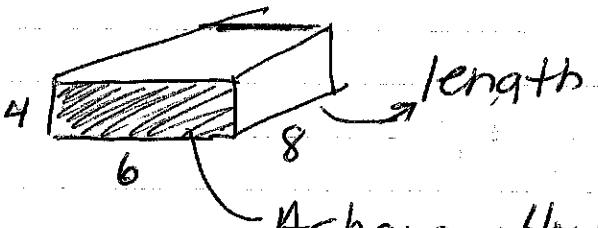
=750

=600

4.5 Volume

* Same for every regular, right angled shape.

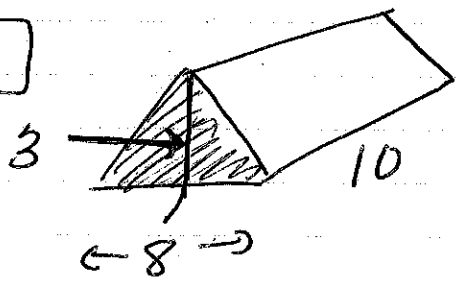
Area shape x how long it is (length)



Ashape = 4x6 = 24
then x by depth (8)

$V = 4 \times 6 \times 8 = 192$

4.6



Shape = △

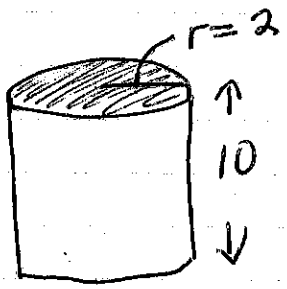
$A = \frac{b \times h}{2} = \frac{8 \times 3}{2} = 12$

V = area shape x length

$= \frac{8 \times 3}{2} \times 10$

$= 120$

4.8



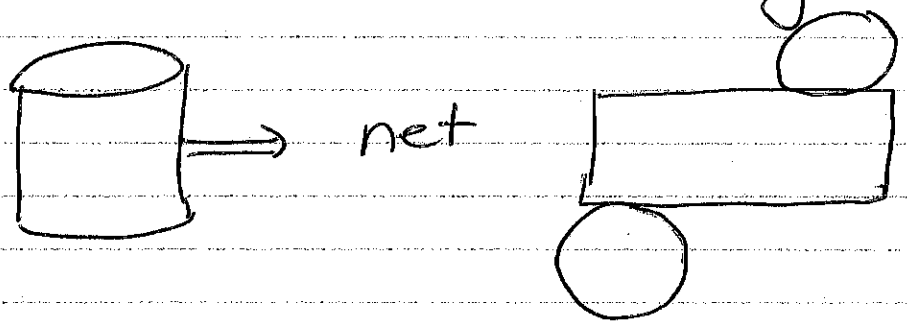
V = area shape x length

$A_0 = \pi r^2 = \pi(2)(2) = 12.56$

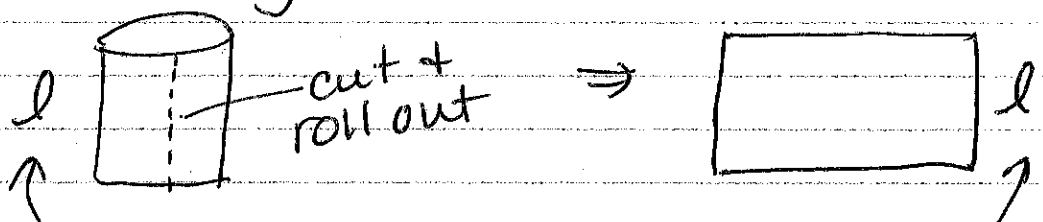
$V = 12.56 \times 10$

$= 125.6$

4.7 Surface Area of a Right Cylinder

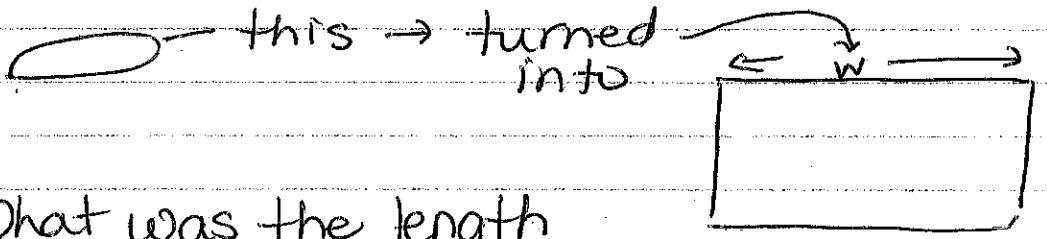


* to understand the net; picture cutting a paper roll.



* note the length is still the length

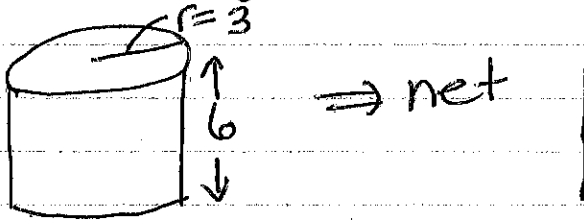
But what is the width?

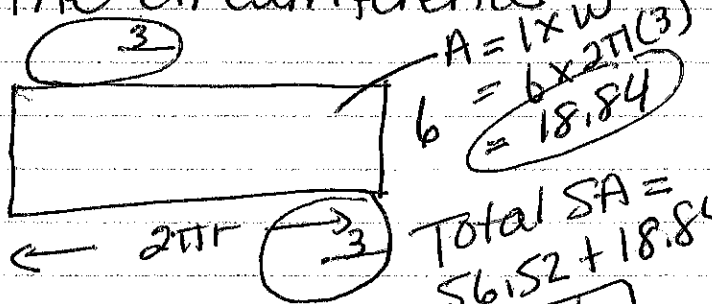


What was the length before?

= Circumference
$= 2\pi r$

So the width is the circumference





$A_0 = \pi r^2 = \pi(3)(3) = 28.26$

2 circles = 28.26 x 2 = 56.52