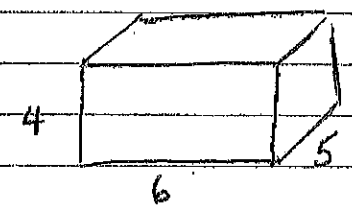
CH2 Math 10 - notes.

Surface Area = Area of all surfaces.

To organize? - look for same/equal sides
such as front + back
side + side
top and bottom.

ex1

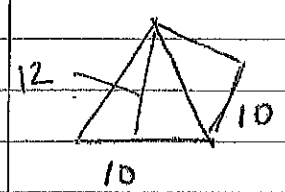


? what sides are the same?

	Front	Back
Front + Back $Area_{Front} = 4 \times 6 = 24$	24	24
side + side $Area_{side} = 5 \times 4 = 20$	20	20
Top + Bottom $Area_{bottom} = 6 \times 5 = 30$	30	30

Surface Area - add all areas together $= 24 + 24 + 20 + 20 + 30 + 30$
$= 148$

ex2



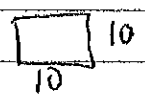
? what sides are the same?

* All 4 triangles

$Area_{\Delta} = \frac{b \times h}{2} = \frac{10 \times 12}{2} = 60$ → since 4 triangles are the same multiply by 4

$A = 60 \times 4 = 240$

* Dont forget the bottom

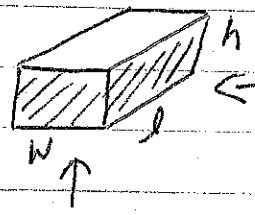


$A = 10 \times 10 = 100$

ADD - Surface Area $= 240 + 100 = 340$.

MA10FPC - CH2

Surface Area & Volume



lateral surface area means - only sides not top + bottom

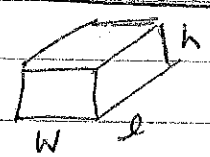
$SA = 2(l \times w) + 2(w \times h) + 2(l \times h)$

$V = l \times w \times h$

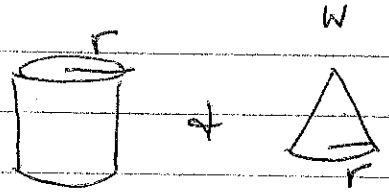
* To find surface area without formula - find area of all sides and add.

* To find volume without the formula - area of shape x h.
  - except cone, pyramid
    area of shape x h ÷ 3

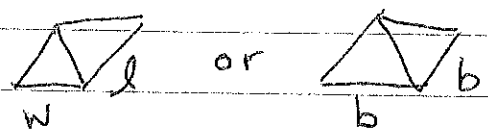
Provincial exam formula sheet:

(area of base) → 

$= w \times l$



$= \pi r^2$



$= b \times b$ or $l \times w$

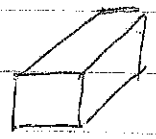
lateral surface area

$SA = \cancel{2\pi r^2} + 2\pi r h$

$SA_{(lateral)} = 2\pi r h$

To work backwards from formula.

① Write down what you know



ex find h if volume $= 90\,cm^3$
and $l = 3$ $w = 6$

$$SA = 2(l \times w) + 2(w \times h) + 2(l \times h)$$

② fill in what you know $\Rightarrow$ $90 = 2(3 \times 6) + 2(6 \times h) + 2(3 \times h)$

$$90 = 2(18) + 12h + 6h$$

$$90 = 36 + 18h$$

$$-36 \quad -36$$

③ * now use algebra

$$54 = 18h$$

$$\div 18 \quad \div 18$$

$$\Rightarrow \boxed{3 = h}$$

$$\therefore h = 3$$

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ex 2

A cylinder has a lateral Surface Area of 188.5. It's radius in 3 cm
What is the height?

① $SA = \cancel{2\pi r^2} \times 2\pi rh$

② $188.5 = 2\pi rh$ (lateral)

$188.5 = 2\pi(3)h$

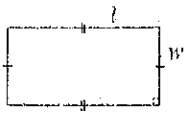
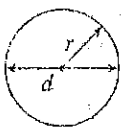
$188.5 = 18.85h$ $\div$ both sides

$10 = h$

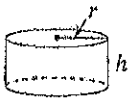
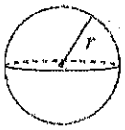
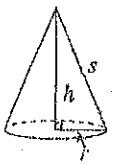
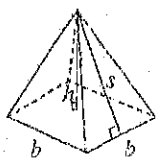
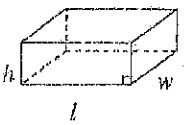
$\therefore h = 10\ cm$

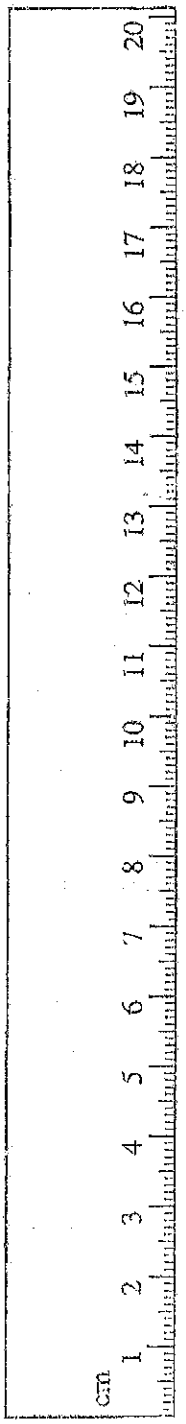
GEOMETRIC FORMULAE

Key Legend	
l = length	P = perimeter
w = width	C = circumference
b = base	A = area
h = height	SA = surface area
s = slant height	V = volume
r = radius	
d = diameter	

Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ or $P = 2(l + w)$	$A = lw$
Triangle	$P = a + b + c$	$A = \frac{bh}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

NOTE: Use the value of π programmed in your calculator rather than the approximation of 3.14.

Geometric Solid	Surface Area	Volume
Cylinder 	$A_{top} = \pi r^2$ $A_{base} = \pi r^2$ $A_{side} = 2\pi rh$ $SA = 2\pi r^2 + 2\pi rh$	$V = (\text{area of base}) \times h$
Sphere 	$SA = 4\pi r^2$ or $SA = \pi d^2$	$V = \frac{4}{3}\pi r^3$
Cone 	$A_{side} = \pi rs$ $A_{base} = \pi r^2$ $SA = \pi r^2 + \pi rs$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Square-Based Pyramid 	$A_{triangle} = \frac{1}{2}bs$ (for each triangle) $A_{base} = b^2$ $SA = 2bs + b^2$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Rectangular Prism 	$SA = wh + wh + lw + lw + lh + lh$ or $SA = 2(wh + lw + lh)$	$V = (\text{area of base}) \times h$
General Right Prism	$SA =$ the sum of the areas of all the faces	$V = (\text{area of base}) \times h$
General Right Pyramid	$SA =$ the sum of the areas of all the faces	$V = \frac{1}{3} \times (\text{area of base}) \times h$



NOTE: Use the value of π programmed in your calculator rather than the approximation of 3.14.