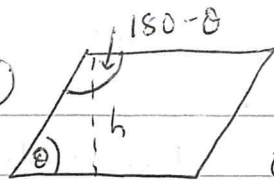
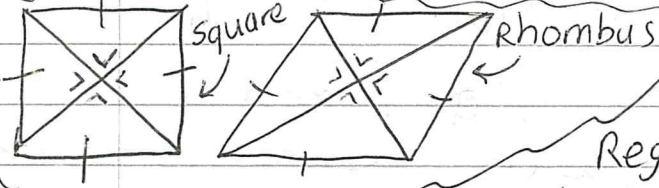


Area and Volume



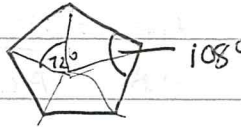
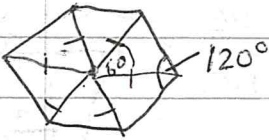
Area = yh or $yx \sin \theta$
 one side \times other side \times Sin angle

Rem $\sin \theta = \sin(180 - \theta)$ so doesn't matter which angle you choose



Polygon = plane shape with straight edges.

Regular Polygon = symmetrical with a repeated base triangle.

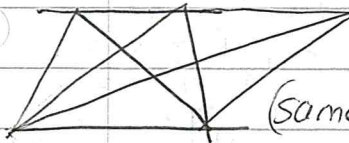


$$180 - 72 = 108$$

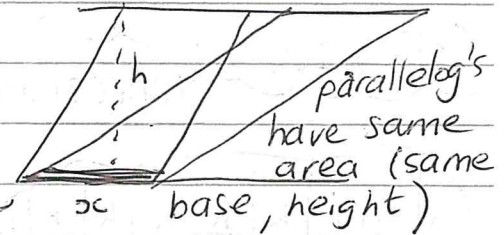
etc

$$108 \div 2 = 54$$

$$360 \div 5 = 72^\circ$$



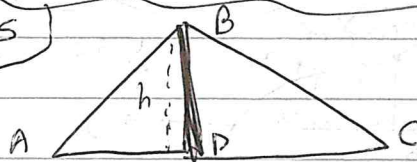
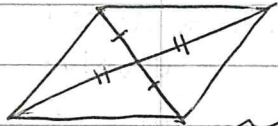
All three Δ 's have same area
 (same height) (same base length)



$$\text{Area} = xh$$

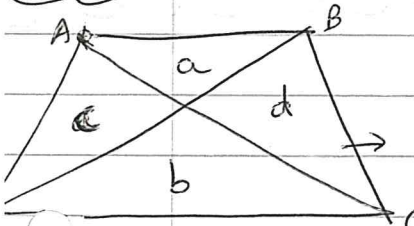
Q2 p195

Q8 p195



$$\text{Area } \Delta ABD = \text{Area } \Delta BCD$$

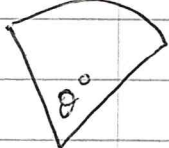
$$= \frac{1}{2} |AD|h = \frac{1}{2} |DC|h = |AD| : |DC|$$



$$\begin{aligned} \text{area } \Delta ADC &= \text{area } \Delta BDC \\ \therefore c &= d \end{aligned}$$

$$\begin{aligned} \text{also } \frac{\text{area } c}{a} &= \frac{x}{y} = \frac{b}{d} \Rightarrow cd = ab \\ c^2 &= ab \\ c &= \sqrt{ab} \end{aligned}$$

$$\text{Area } \square = a + b + c + d = a + b + 2c = a + b + 2\sqrt{ab}$$



$$A = \frac{\pi r^2 \times \theta}{360}$$



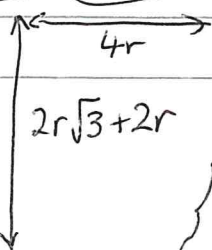
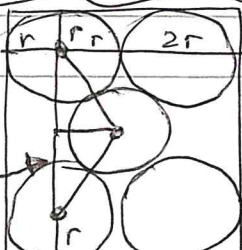
$$A = \frac{\pi r^2 \times \theta}{2\pi} = \frac{1}{2} r^2 \theta$$

$$l = \frac{2\pi r \cdot \theta}{360}$$

$$l = \frac{2\pi r \cdot \theta}{2\pi} = r\theta$$

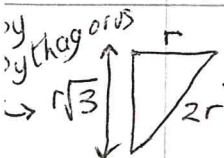
Rem: to find area of irregular shapes either split into regular shapes and add - or express as a regular shape minus another regular shape.

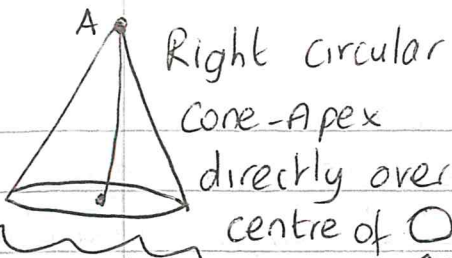
Q12 p201



Q11 p201

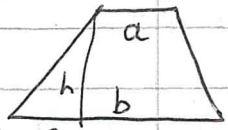
PRISM = 3D object
 with same Cross Sect. Area along a length
 $V = \text{Area of CS}(A) \times \text{length}(l)$





$$\text{Surface area} = \frac{4\pi r^2}{2} + \pi r^2 = 3\pi r^2$$

Pyramid:



$$\text{Area} = \left(\frac{a+b}{2}\right)h$$

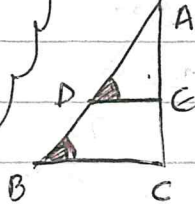
$$V = \frac{1}{3} (\text{area of base}) h$$

Q11 p 208

Q13 p 209



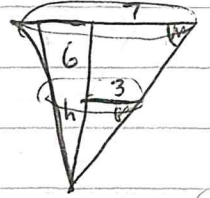
= Frustum



$\triangle ADE$ is similar to $\triangle ABC$

$$\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$$

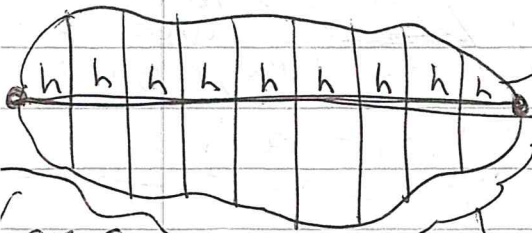
$$\text{or } \tan \theta = \frac{AC}{BC} = \frac{AE}{DE}$$



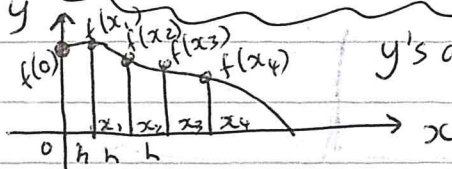
Q12 p 208

TRAPEZOIDAL RULE

$$\frac{6+h}{7} = \frac{h}{3}$$



$$\text{Area} = \frac{h}{2} (y_1 + y_n + 2(y_2 + \dots + y_{n-1}))$$



y's are f(x)'s

you can

be given

area & asked to

find a y value

or h (one eqn, one unknown)

Q7, 8
Q9 p 218