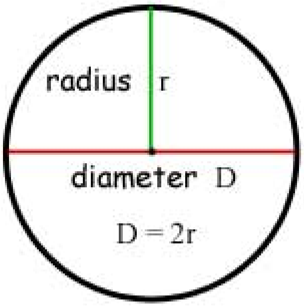
Area of a circle



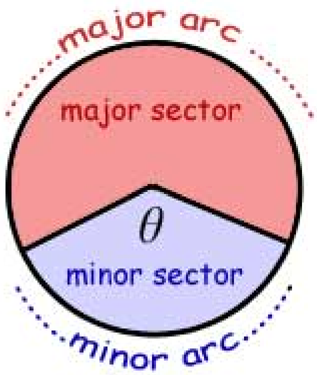
the area of a circle of radius 'r' = πr^2

the circumference of a circle of radius 'r' = $2\pi r$

since diameter $D = 2r$

the circumference of a circle is = πD

Arcs



length (L_a) of an arc is given by:

$$L_a = \left(\frac{\text{subtended angle}}{\text{no. degrees in a circle}}\right) \times (\text{circumference of the circle})$$

$$= \frac{\theta}{360^\circ}(2\pi r)$$

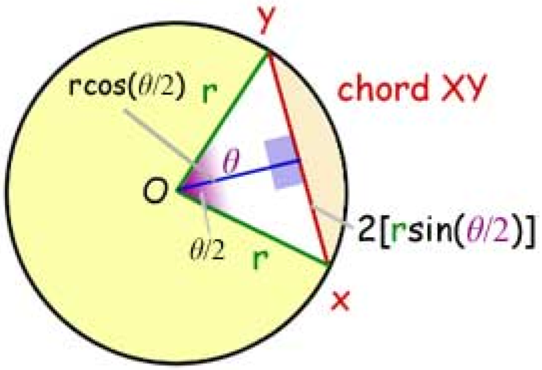
Sectors

area (A_s) of a sector is given by:

$$A_s = \left(\frac{\text{subtended angle}}{\text{no. degrees in a circle}}\right) \times \text{(area of the circle)}$$

$$= \frac{\theta}{360^\circ}(\pi r^2)$$

Segments



$$\text{area of minor segment XY} = \text{area of sector XOY - area of triangle XOY}$$

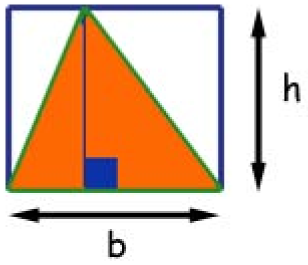
$$= \frac{\theta^\circ}{360^\circ} \times \text{circle area - } \frac{1}{2}\text{(base)} \times \text{(height)}$$

$$= \left(\frac{\theta^\circ}{360^\circ} \times \pi r^2\right) - \frac{1}{2}\left[2r\sin(\theta/2) \times r\cos(\theta/2)\right]$$

Triangles

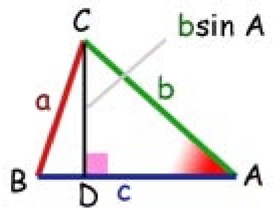
When a triangle is incribed in a rectangle of height h and width b, the perpendicular divides the shape. It can be seen that each rectangle formed is composed of two triangles of equal area. Hence the area of the original triangle is half that of the rectangle.

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



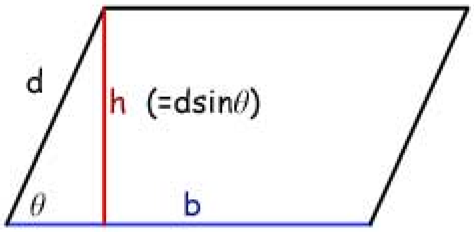
The expression containing the sine is really the same as above.

$$\text{Area} = \frac{1}{2} bc \sin A$$



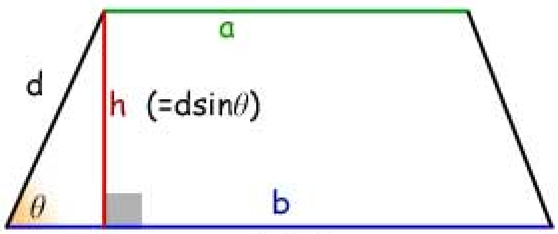
$$\begin{aligned} \text{area} &= \frac{1}{2}(\text{base}) \times (\text{height}) \\ &= \frac{1}{2}(c) \times (b \sin A) \\ &= \frac{1}{2} cb \sin A \\ &= \frac{1}{2} bc \sin A \end{aligned}$$

Parallelograms



$$\text{area} = b \times h$$
$$= bd\sin\theta$$

Trapeziums(Trapezoids)



$$\text{area} = \frac{(ab)}{2}h$$
$$= \frac{(ab)}{2}d\sin\theta$$