# Elementary Mathematics Notes (Diagrams)

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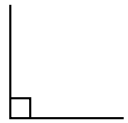
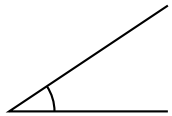
## 1 Angles, Triangles & Polygons

### Names of angles

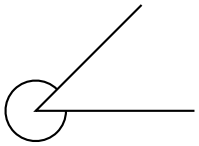


right angle
($90°$)



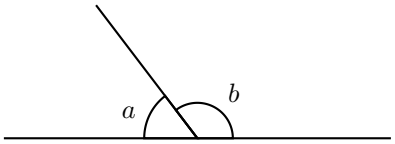
acute angle
($< 90°$)

obtuse angle
($90° < \theta < 180°$)

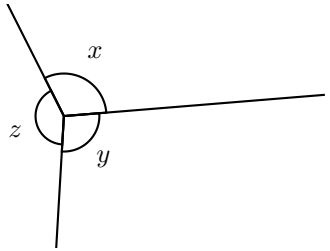


reflex angle
($180° < \theta < 360°$)

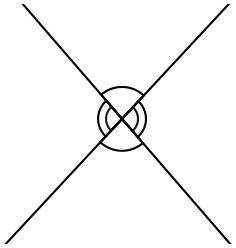
### Types of angles



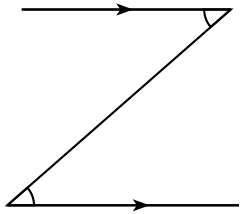

$\angle$ on a st. line



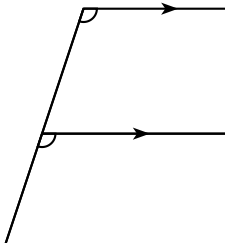

$\angle$ at a pt.



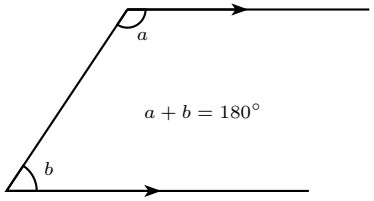
vert. opp. $\angle$



alt. $\angle$



corr. $\angle$

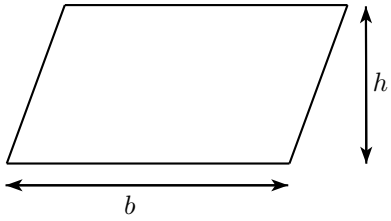



int. $\angle$

## 2 Mensuration

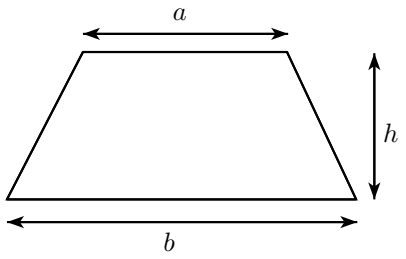
### Perimeter & area

### Parallelogram



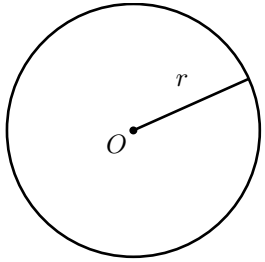

Area $= b \times h$

### Trapezium




Area $= \frac{a+b}{2} \times h$

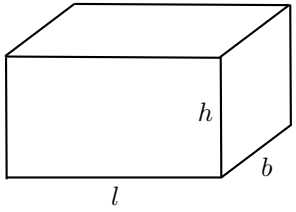
### Circle




Circumference $= 2\pi r$
Area $= \pi r^2$

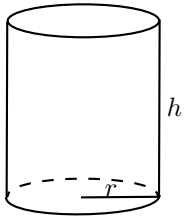
## Surface area & volume

### Cuboid



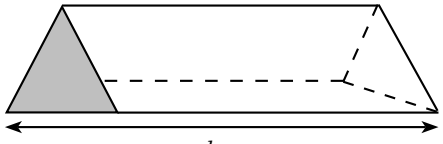

Surface area $= 2(lb + lh + bh)$
Volume $= l \times b \times h$

### Cylinder



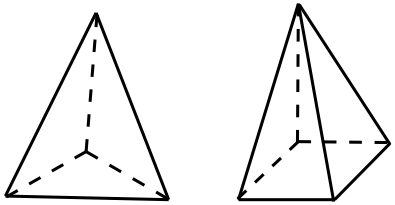

Surface area = 2 × base area + curved surface area
$= 2\pi r^2 + 2\pi rh$
Volume = base area × height
$= \pi r^2 h$

### Prism



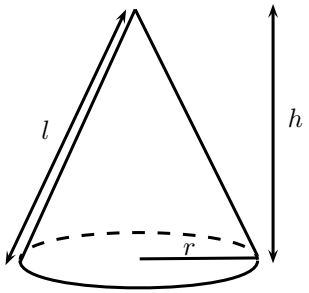

Volume = cross-sectional area × $l$

### Pyramid



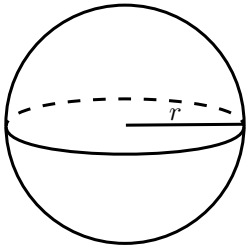
Volume $= \frac{1}{3}\times$ base area × height

### Cone




Volume $= \frac{1}{3}\times$ base area × height
$= \frac{1}{3}\pi r^2 h$
Surface Area = base area + curved surface area
$= \pi r^2 + \pi rl$

### Sphere

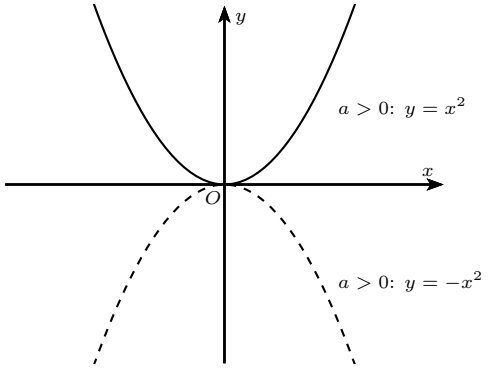



Volume $= \frac{4}{3}\pi r^3$
Surface area $= 4\pi r^2$

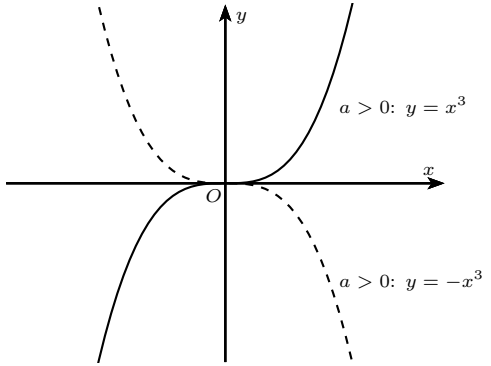
# 3 Functions & Graphs

### Graphs of power functions ($y = ax^n$)

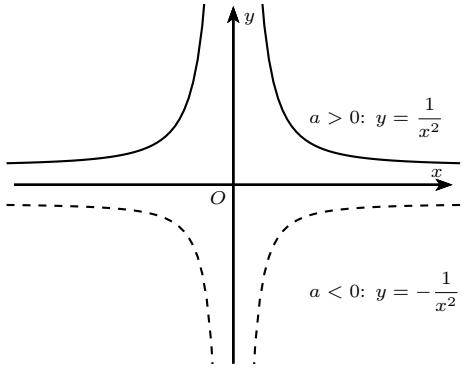
$n = 2$



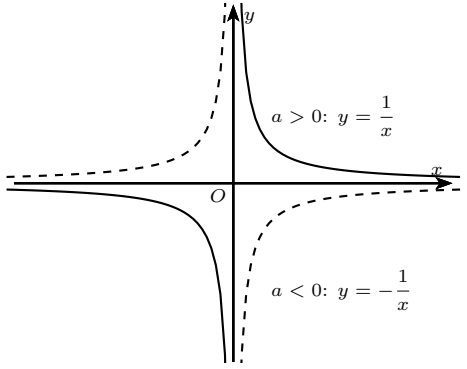

$n = 3$




$n = -2$



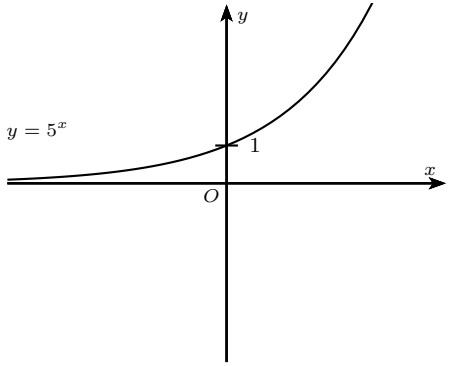

$n = -1$



## 4 Exponential Function (Graphs)

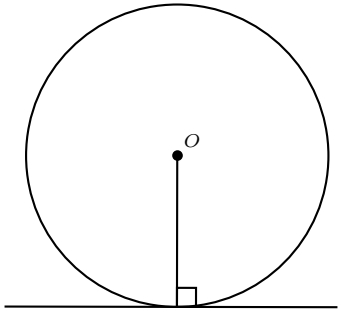
### Graphs of exponential function

$\boxed{y = a^x}$

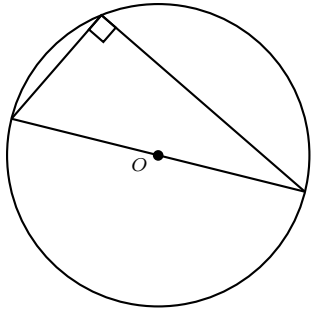



## 5 Properties Of Circles

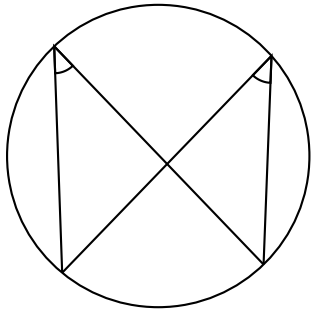
### Angle properties



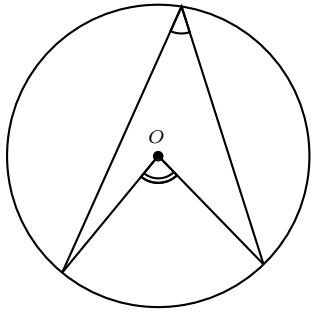

tan. $\perp$ rad.



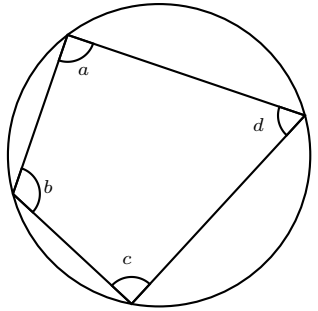

rt. $\angle$ in semicircle



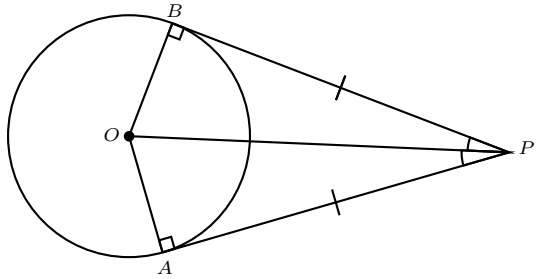
$\angle$s in same seg.




$\angle$ at centre = 2 $\angle$ at circ.



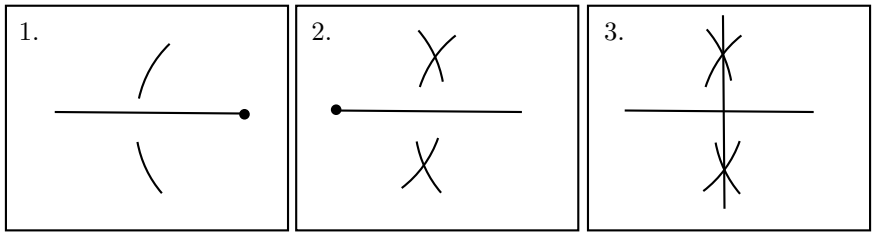

$\angle$s in opp. seg. ($a + c = b + d = 180°$)




tan. from ext. pt.

## 6 Bisectors

**Constructing perpendicular bisector**




**Constructing angle bisector**