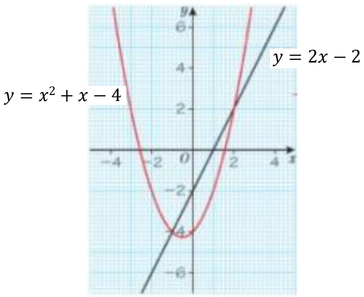
Quadratic Graphs

V180 V181 V276c VCubic

Solving Simultaneous Equations

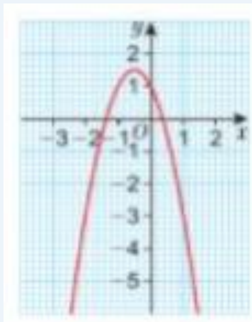


The solutions are:
$x = 2. y = 2$ *and* $x = -1. y = -4$

The lowest or highest point of the parabola, where the graph turns, is called the **turning point**.
The turning point is either a minimum or a maximum point
The x-values where the graph intersects the x-axis are the solutions, or **roots** of the equation y=0

When a quadratic is written in completed square from y=a(x+b)2+c the coordinate of the turning point is (-b,c)

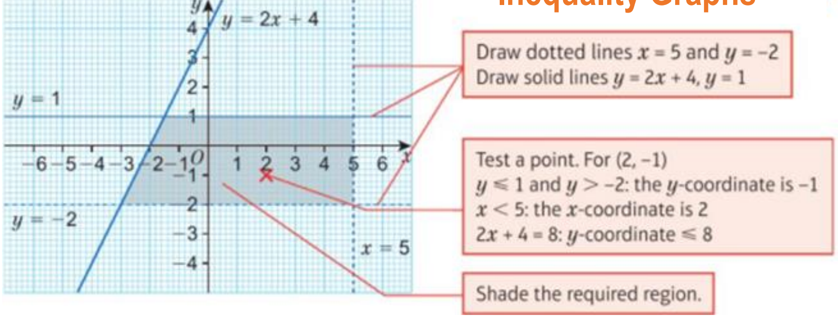
To sketch a quadratic function
- Calculate the solutions to the equation 'y=0' (points of intersection with the x-axis)
- Calculate the point at which the graph crosses the y-axis
- Find the coordinates of the turning point and whether it is a maximum or minimum



The quadratic equation $ax^2+bx+c=0$ is said to have no real roots if its graph does not cross the x-axis. If its graph just touches the x-axis, the equation has one repeated root.

On a coordinate grid, shade the region that satisfies the inequalities $x < 5, y \leq 2x$+4, y≤ 1 *and* $y > -2$

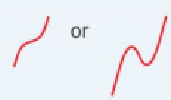
Inequality Graphs



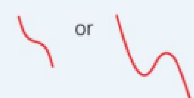
Cubic Graphs

A **cubic** function is one whose highest power of x is x2.
It is written in the form $\mathbf{y=ax^3+bx^2+cx+d}$

When a>0 the function looks like



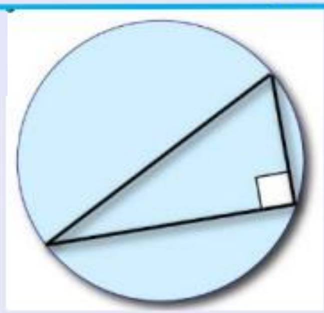
When a<0 the function looks like



The graph intersects the y-axis at the point y=d
The graph's roots can be found by finding the values of x for which y=0

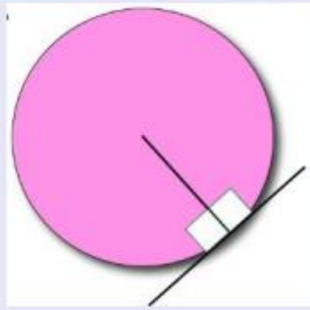
Unit 16 Higher Circle Theorems

V64 V65



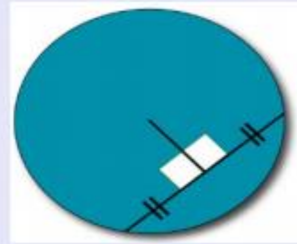
The angle in a semicircle is a right angle.

V65a



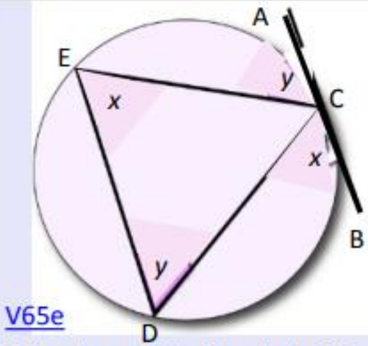
The angle between a **tangent** and **radius** is a right angle.

V65f



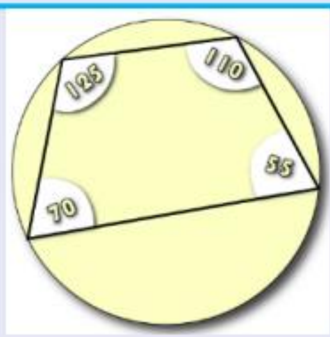
A **chord** is a straight line connecting two points on a circle.

The **perpendicular** from the centre of the circle to a chord **bisects** the chord and the line drawn from the centre of the circle to the **midpoint** of a chord is at right angles to the chord.



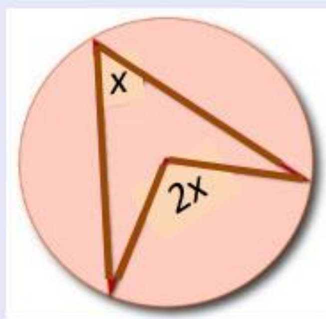
V65e

AB is a tangent to the circle. CD, DE and CE are **chords**. Angle ECA is the angle between the **tangent** and the chord in one segment. The other **segment** has angle CDE. This is the **alternate segment.** The angle between the chord and tangent is equal to the angle in the alternate segment.



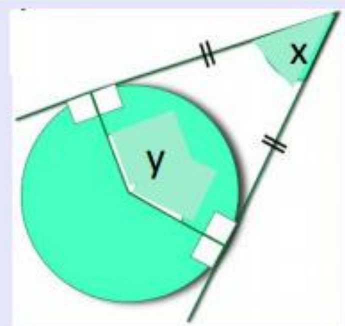
A cyclic quadrilateral with all four vertices on the circumference of the circle. Opposite angles add up to 180°.

V65d

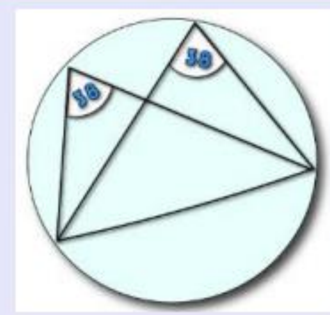


The angle at the centre of a circle is twice the angle at the circumference when both are subtended by the same arc.

V65b



Tangents drawn from a point outside the circle are equal in length.
x + y = 180



Angles in the same segment and standing on the same chord are always equal.

V65c