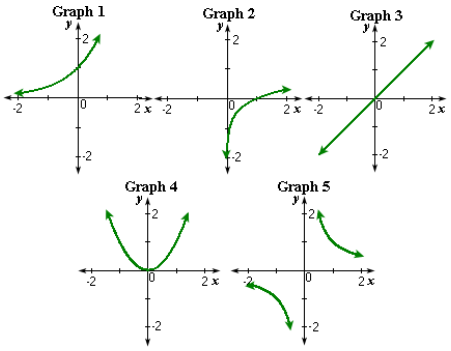
Week 9
Term 1
2021

HAWKER COLLEGE
Engage | Inspire | Achieve

Learning Brief

SMM1



Goals

This week:

- Quadratic functions, their graphs, and features
- Quadratic skills (factorising, completing the square)
- Using CAS to sketch functions

Theoretical Components

You will need to have a good working knowledge of domain and range, functions and relations for the assignment. Make sure you have completed all the tasks on Mathspace.

Quadratics:

You need to know about dilation, vertical translation, horizontal translation, vertex, axis of symmetry, reflection, roots, and intercepts

Forms: Base form $y = x^2$
General form $y = ax^2 + bx + c$
Vertex (h,k) form $y = a(x - h)^2 + k$
Fully factorised form $y = (ax - m)(fx - n)$

Make notes on the following chapters and websites:

- 2C Factorising quadratic expressions
- 2D Factorising by completing the square
- 2E Solving quadratic equations - Null Factor Law
- 2F Solving quadratic equations - completing the square

- https://www.mathsisfun.com/algebra/quadratic-equation-real-world.html

Practical Components

Do the following questions:
Organise your solutions neatly in your exercise book.

You will require Chapter 2 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 2C: 7, 9
- 2D: 1i, 2i, 7
- 2E: 2a, d, g, 3a, d, j, 8, 10, 12
- 2F: 2

Mathspace Task

If you get stuck on 2C Q9, see your teacher.

Investigation

See next page

QFO

Quiz/Forum/Other

Complete any missing Mathspace tasks.

Week 9 Investigation

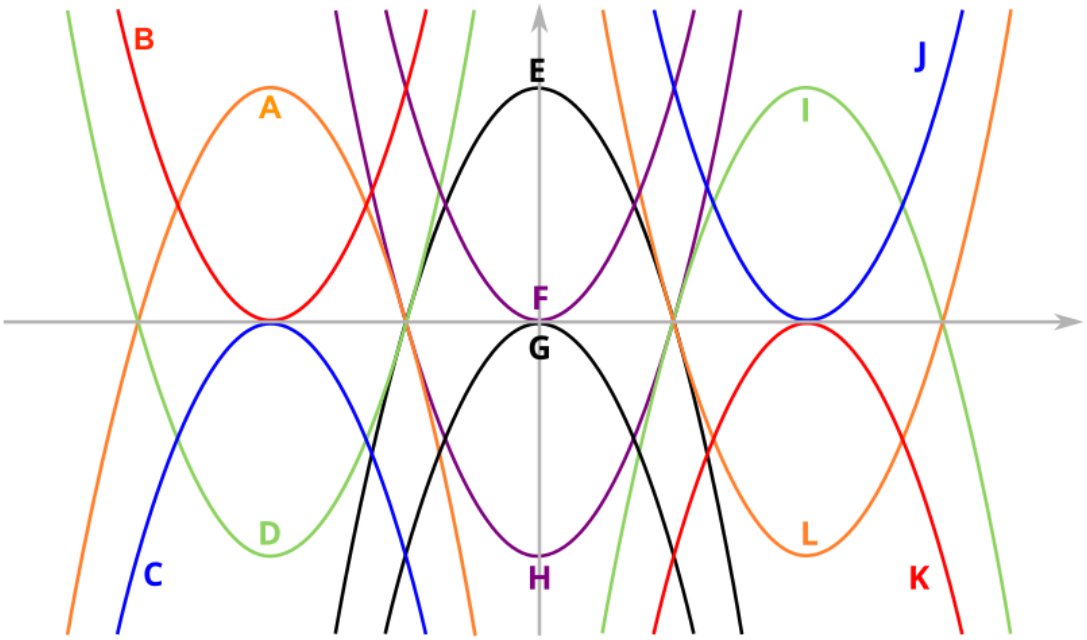
This is a two-part investigation.

PART A:

Use DESMOS or your CAS to investigate the effect that the value of *k* has on the shape and position of the graph $y = x^2$ in the following situations.

	$k > 0$	$k < 0$	$0 < k < 1$	$k > 1$
$y = kx^2$	--			
$y = x^2 + k$			--	--
$y = (x + k)^2$			--	--
$y = (kx)^2$	--			
$y = x^2 + kx$			--	--
Any other observations?				

PART B:



Given that two of the parabolas have equations

$$y = x^2 - 12x + 27 \text{ and } y = -x^2 + 12x - 36$$

Find the equations of the other parabolas.

A		**G**	
B		**H**	
C		**I**	
D		**J**	
E		**K**	
F	$y = x^2$	**L**	