## Goals



Unit goals for Mathematical Methods:

- understand the concepts and techniques in algebra, functions, graphs, trigonometric functions and probability
- solve problems using algebra, functions, graphs, trigonometric functions and probability
- apply reasoning skills in the context of algebra, functions, graphs, trigonometric functions and probability
- interpret and evaluate mathematical information and ascertain the reasonableness of solutions to problems
- communicate their arguments and strategies when solving problems.


## Theoretical components

## Knowledge Checklist:

- Expanding
- Simplifying
- Collecting like terms
- Rearranging
- Algebraic fractions


## Online Links

- https://www.mathsisfun.com/algebra/liketerms.html
- https://www.mathsisfun.com/algebra/expan ding.html
- https://www.mathsisfun.com/algebra/polyno mials-multiplying.html
- https://www.mathsisfun.com/algebra/fractio ns-algebra.html


## Diagnostic Test Week 2 Monday (5\%)

## Practical components

## Do the following questions:

Organise your solutions neatly in your exercise book.
Cambridge Unit 3 textbook

- $1 \mathrm{~A}, 1 \mathrm{~B}, 1 \mathrm{D}$ - every third question (1a, 1d, 2a, 2d, ...)


## Prime factorisation

View the following website and investigate prime factors, greatest common factor and lowest common multiple.
http://www.mathplayground.com/factortrees.htm I
Answer the following, showing working:
What is the prime factorisation of 84 ?
What is the prime factorisation of 72 ?
What are the GCF and the LCM of 84 and 72 ?

## Investigation

See next page
$\square$ Make sure you have joined the Google Classroom. If you have not, see your teacher.
Fun fact: Why do we use the letter $x$ to represent an unknown variable? No-one knows. One theory is that it is the result of Europeans attempting to translate Arabic mathematical texts into Spanish - they borrowed the Greek symbol $\boldsymbol{x}$ to represent an unknown, undefined quantity. Over time and further translations, this simply evolved to the letter $x$.

## Week 1 Investigation

1. Complete every second question. Organise your solutions neatly in your exercise book. Show working.

Perform the indicated operations.

1. $\left(2 x^{2}-6 x+11\right)+\left(-3 x^{2}+7 x-2\right)$
2. $\left(-4 y^{2}-3 y+8\right)-\left(2 y^{2}-6 y-2\right)$
3. $-6\left(2 q^{2}+4 q-3\right)+4\left(-q^{2}+7 q-3\right)$
4. $2\left(3 r^{2}+4 r+2\right)-3\left(-r^{2}+4 r-5\right)$
5. $\left(0.613 x^{2}-4.215 x+0.892\right)-0.47\left(2 x^{2}-3 x+5\right)$
6. $0.5\left(5 r^{2}+3.2 r-6\right)-\left(1.7 r^{2}-2 r-1.5\right)$
7. $-9 m\left(2 m^{2}+3 m-1\right)$
8. $6 x\left(-2 x^{3}+5 x+6\right)$
9. $(3 t-2 y)(3 t+5 y)$
10. $(9 k+q)(2 k-q)$
11. $(2-3 x)(2+3 x)$
12. $(6 m+5)(6 m-5)$
13. $\left(\frac{2}{5} y+\frac{1}{8} z\right)\left(\frac{3}{5} y+\frac{1}{2} z\right)$
14. $\left(\frac{3}{4} r-\frac{2}{3} s\right)\left(\frac{5}{4} r+\frac{1}{3} s\right)$
15. $(3 p-1)\left(9 p^{2}+3 p+1\right)$
16. $(3 p+2)\left(5 p^{2}+p-4\right)$
17. $(2 m+1)\left(4 m^{2}-2 m+1\right)$
18. $(k+2)\left(12 k^{3}-3 k^{2}+k+1\right)$
19. $(x+y+z)(3 x-2 y-z)$
20. $(r+2 s-3 t)(2 r-2 s+t)$
21. $(x+1)(x+2)(x+3)$
22. $(x-1)(x+2)(x-3)$
23. $(x+2)^{2}$
24. $(2 a-4 b)^{2}$
25. $(x-2 y)^{3}$
26. $(3 x+y)^{3}$

## AST Style Question:

2. Juan's age is a prime number. Amina's age has 8 factors, and she is one year older than Juan.
a. Of the following numbers, which could be the sum of their ages? Show working.
i. 27
ii. 39
iii. 75
iv. 87
v. 107

Hints:

- Write each of the multiple-choice answers as a sum of two consecutive numbers.
- Is the smaller number prime? How many factors does the larger number have?
b. What is the youngest age that Juan could be?

