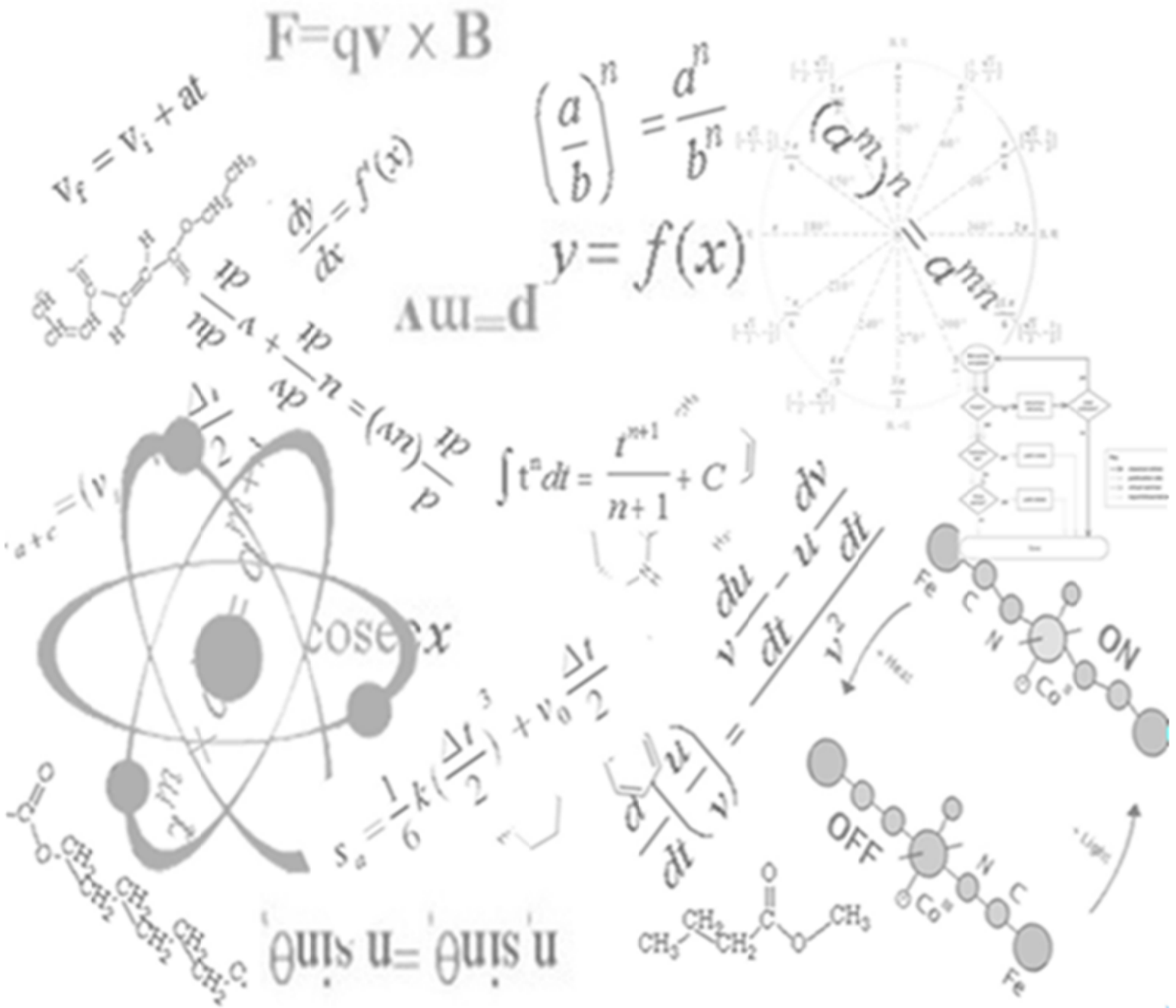
where students come first!

S4S coaching

Year 11- Mathematics Advanced

Sequence and Series



Sequences and series Exam /35

1. (**3 marks**)

The nth term in an arithmetic series is given by $T_n = 4n + 7$. Find the 12th term of this series and find the sum of the first 20 terms of this series.

2. (**3 marks**)

The geometric series $a+ar+ar^2+\ldots$ has a second term 1/4 and a limiting sum of 1. Find 'a' in terms of 'r' and solve a pair of simultaneous equations to find 'r'.

3. (**3 marks**)

Simplify $n=0.0\dot{8}\dot{2}$ into fraction form.

4. (**3 marks**)

The second term of a G.P is 120 and the fifth term is 15. Find the common ratio and first term of the series and find the limiting sum.

5. (**5 marks**)

Karam and Girgis decided to borrow $150000 to buy a small centre for their new tutoring business. Interest is compunded monthly at 6% p.a. The loan is to be repaid at the end of 15 years with equal monthly repayments of $M.

i) find an expression for A_n

ii)Find value for M

iii) hence calculate the amount still owing after 5 years of payment.

6. (**5 marks**)

For the arithmetic sequence: 56,53,50...

i) find an expression for the nth term in simplest form

ii) find the value of the first negative ter of the sequence.

7. (**3 marks**)

Evaluate $\sum_{k=10}^{k=50}(3k+1)$

8. (**3 marks**)

Consider the series: $\sin^2 x + \sin^4 x + \sin^6 x + \ldots$

Show that a limiting sum exists for $0<x<\frac{\pi}{2}$

9. (**5 marks**)

The attendance at a speed reading course has an average increase of 20 people per month. The original attendance was 100 people.

i) how many people attended after 2 years

ii) how long before the attended classes reach 1500?

iii) if the cost of classes is $50 per month per person, find the takings for the first 5 months.

10. (**2 marks**)

Find the sum of the first 50 terms of the series: 10+7+4+...