

**Procedural knowledge**

- a Relating Calculus to Engineering contexts
- b Using Differentiation as gradient
- c Using Differentiation as rate-of-change
- d Algebraic skills
- e Using Integration as area
- f Using Integration as inverse of Differentiation
- g Problem-Solving to choose between Integration and Differentiation
- h Writing a report
- i Writing a Proposal
- j

Week	Wednesday Date	Calendar constraints	Disciplinary Knowledge area
1	06/09/2023		Learning Aim A
2	13/09/2023		Learning Aim A
3	20/09/2023		Learning Aim A
4	27/09/2023		Learning Aim A

		Learning Aim A
5	04/10/2023	
		Learning Aim A
6	11/10/2023	
		Learning Aim A
7	18/10/2023	
8	25/10/2023	HT
		Learning Aim A
9	01/11/2023	
		Learning Aim A
10	08/11/2023	
		Learning Aim A

11	15/11/2023	
		Learning Aim A
12	22/11/2023	
		Learning Aim A
13	29/11/2023	
		Learning Aim A
14	06/12/2023	
		Learning Aim B
15	13/12/2023	
		Learning Aim B
16	20/12/2023	
17	27/12/2023	Xmas

18	03/01/2024	Xmas	
			Learning Aim B
19	10/01/2024		
			Learning Aim B
20	17/01/2024		
			Learning Aim B
21	24/01/2024		
			Learning Aim A
22	31/01/2024		
			Learning Aim B
23	07/02/2024		

24	14/02/2024	HT	
			Learning Aim B
25	21/02/2024		
			Learning Aim B
26	28/02/2024		
			Learning Aim B
27	06/03/2024		
			Learning Aim B
28	13/03/2024		
			Learning Aim B
29	20/03/2024		
			Learning Aim B
30	27/03/2024		

31	03/04/2024	Easter	
32	10/04/2024	Easter	
33	17/04/2024		Learning Aim C
34	24/04/2024		Learning Aim C
35	01/05/2024		Learning Aim C
36	08/05/2024		Learning Aim C
37	15/05/2024		Learning Aim C

38	22/05/2024		
39	29/05/2024	Half Term	
40	05/06/2024		Learning Aim B
41	12/06/2024		Learning Aim C
42	19/06/2024		
43	26/06/2024	y12 mocks	

44	03/07/2024	post-18 day	
45	10/07/2024		
46	17/07/2024	work exp	



## Disciplinary Knowledge Content

laws of indices EX 10

Graphical gradients; differentiation of polynomials;

evaluating gradients; increasing and decreasing functions

differentiating logs, exponentials and trig functions

inverse sin and cos in radians

Turning Points

instantaneous rest and applications to mechanics and optimisation

2nd derivatives; further optimisation

simple chain rules; harder chain rules

product rule and quotient rule

Differentiation in-context (which letters are variables, which are constants, dependent and independent variables); first principles

Ass A - initial

Ass A - initial

Indefinite Integration as anti-differentiation for polynomials,

Indefinite Integration as anti-differentiation for logs, exponentials and trig

Linear Reverse Chain Rule,

Substitution and by Parts

Integrating by Trig Identities

Ass A - resub

Rearranging exponentials

Application to mechanics s-v-a; solving differential equations

Definite integrals and finding areas

Mean value and RMS value

Numerical Integration

Ass B - initial

Ass B - initial

Choosing between Integration and Differentiation

Interpreting constants and choosing methods

Making a proposal

Ass C - initial

Ass C - initial

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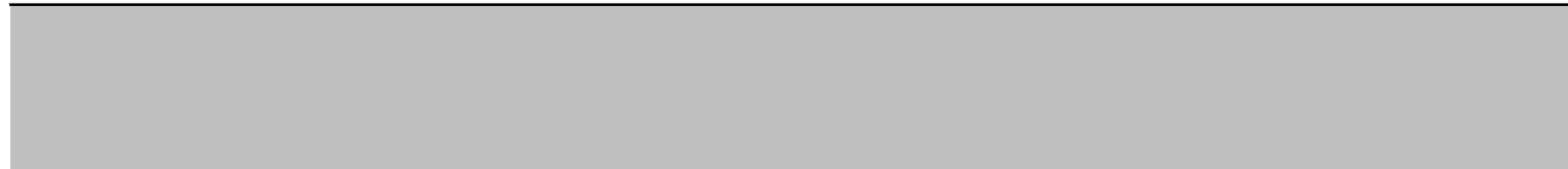
study leave/revision/slack/supporting Unit1




Ass B Resubmission Begins

Ass C - resub


study leave/revision/slack/supporting Unit1





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study leave/revision/slack/supporting Unit1





Disciplinary knowledge, that this interleaves with	Procedural knowledge progression
	d
Laws of Indices Quadratics	a,b,d
Graphical gradients; differentiation of polynomials;	a,b,d
Differentiation of polynomials Laws of Indices Quadratics unit 1 exponentials and trigonometry	a,c,d

unit 1 trigonometry	d
Rearranging (unit1) All Differentiation skills All types of functions (polynomial, Trigonometric, Exponential, Logarithmic)	a,d
All Differentiation skills All types of functions (polynomial, Trigonometric, Exponential, Logarithmic)	a,b,c,d
Rearranging (unit1) All Differentiation skills All types of functions (polynomial, Trigonometric, Exponential, Logarithmic)	a,c,d
All Unit 7A plus Unit 1 rearranging/algebra/trigonometry/expor	a,b,c,d,
All Unit 7A plus Unit 1 rearranging/algebra/trigonometry/expor	a,b,c,d

Non-routine Differentiation skills All Differentiation skills All types of functions (polynomial, Trigonometric, Exponential, Logarithmic)	a,c,d
	a,b,c,d,h
	a,b,c,d,h
All routine differentiation skills Indices	a,d,f
All routine differentiation skills Indices	a,d,f

All routine Integration skills All routine and non-routine differentiation skills	d,f
All routine Integration skills All routine and non-routine differentiation skills	d,f
All routine Integration skills All routine and non-routine differentiation skills	d,f
	a,b,c,d,h
Unit 1 exponentials	d

Application of Differentiation to mechanics All routine and non-routine Integation skills	d,f,g
All routine and non-routine Integation skills	a,d,e
All routine and non-routine Integation skills Unit 1 Trigonometry	a,d,e
	a,d,e
All routine and non-routine Integation skills All routine differentiation skills Numerical Integration Definite Integration Applications of Integation to Mechanics	a,d,e,f,h
All routine and non-routine Integation skills All routine differentiation skills Numerical Integration Definite Integration Applications of Integation to Mechanics	a,d,e,f,h

All routine and non-routine Integation skills All routine and non-routine differentiation skills Applications of Integation to Mechanics	a,c,e,f,g
All routine and non-routine Integation skills All routine and non-routine differentiation skills Applications of Integation to Mechanics	a,d,g
All routine and non-routine Integation skills All routine and non-routine differentiation skills Applications of Integation to Mechanics	i
All routine and non-routine Integation skills All routine and non-routine differentiation skills Applications of Integation to Mechanics	a,c,d,f,g,h,i
All routine and non-routine Integation skills All routine and non-routine differentiation skills Applications of Integation to Mechanics	a,c,d,f,g,h,i



All routine and non-routine Integation skills                      a,d,e,f,h  
All routine differentiation skills  
Numerical Integration  
Definite Integration  
Applications of Integration to Mechanics

All routine and non-routine Integation skills                      a,c,d,f,g,h,i  
All routine and non-routine differentiation skills  
Applications of Integration to Mechanics



