

A close-up photograph of a light-colored watering can with water droplets on its surface, pouring water onto a small green seedling growing from dark brown soil. The background is a soft-focus green garden.

Formative feedback


Providing individualised feedback to students using
Excel and Word's Mail Merge to promote growth

Claire Rollinson 2022

Image source: <https://garden.lovetoknow.com/image/254882~watering.jpg>

Motivations and the end product

- Students tend to focus on the mark rather than what can be learned from a task
- The identification of strengths and areas for improvement is more informative than a grade
- There is rarely time available in class to give each student detailed feedback
- Each assessment task is a valuable learning tool that should be used to promote the development of skills and knowledge
- A visual representation of achievement-by-topic can be more informative than a grade



Year 10 Physics Semester 2 2022

Test 1: Vectors and Motion

Name: Student 2

Class: 10SPH02

					Achievement							
Ch	Description	Q ^{ns}	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent				
8.2	Adding vectors in one and two dimensions	8,10	1	2					●			
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1								●
8.4	Vector components	12,14	4	5							●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4	●							
9.2	Acceleration	5,11	1	2	●							
9.3	Graphing position, velocity & acc ⁿ over time	7,13	6	7			●					
9.4	Equations for uniform acceleration	15cd	0	3	●							
9.5	Vertical motion	2,3,6	3	3				●				
Deduction for incorrect direction			0									
Deduction for incorrect units			0									
Total marks awarded (out of 27)			18									
Scaled grade			C+									


Feedback:

Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, remember to read questions carefully and that constant velocity means $a = 0$.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. $\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of $g = 9.8 \text{ m/s}^2$ near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.

Generating automated feedback

- By collecting the marks awarded for each question on a task, we can use Excel to generate automated achievement-by-topic data for each student
- We can then use Word's mail merge function to generate an individualised report for each student
- General feedback for each correct/incorrect question can be generated and then adjusted for each student

<div>  <div> Year 10 Physics Semester 2 2022 Test 1: Vectors and Motion Name: Student 2 Class: 10SPH02 </div> </div>					Achievement			
Ch	Description	Q ^{ns}	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	1	2		●		
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				●
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	1	2		●		
9.3	Graphing position, velocity & acc ⁿ over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
Deduction for incorrect direction			0					
Deduction for incorrect units			0					
Total marks awarded (out of 27)			18					
Scaled grade			C+					

Feedback:
Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s² downwards toward the centre of Earth.
- As in Q4, remember to read questions carefully and that constant velocity means $a = 0$.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. $\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of $g = 9.8 \text{ m/s}^2$ near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.

The files

- To download these slides along with the Excel and Word templates go to:

<https://github.com/clairerollinson/auto-feedback-for-students>

The process in Excel

- Download the Excel template and enter class details on the Summary tab
- Go through the assessment task, identify the topics covered in each question
- The first step in Excel is to adjust the topics in the rainbow cells from BN54:BN64
- The spreadsheet is set up for a maximum of 11 topics and 40 questions per task
- Adjust green cells only (and BN54:BN64 and BG54:BG93)

	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
51																	
52	Question details						Task Summary (limit: 11 topics and 40 questions)										
53	Question	Topic	MC correct or marks available				Count	Questions	Topic	marks	%	Topic description					
54	1	9.1	D				2	8,10	8.2	2	7%	Adding vectors in one and two dimensions					
55	2	9.5	C				1	9	8.3	1	4%	Subtracting vectors in one and two dimensions					
56	3	9.5	B				2	12,14	8.4	5	19%	Vector components					
57	4	9.1	A				3	1,4,15ab	9.1	4	15%	Displacement, speed and velocity					
58	5	9.2	B				2	5,11	9.2	2	7%	Acceleration					
59	6	9.5	D				2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over					
60	7	9.3	B				1	15cd	9.4	3	11%	Equations for uniform acceleration					
61	8	8.2	A				3	2,3,6	9.5	3	11%	Vertical motion					
62	9	8.3	B														
63	10	8.2	A														
64	11	9.2	C														
65	12	8.4	A														
66	13	9.3	6				Totals	16		27	100%						
67	14	8.4	4														
68	15ab	9.1	2														
69	15cd	9.4	3														
70																	

The process in Excel

- Once cells BN54:BN64 are completed, complete the 'Question details' from BF54 down
- Adjust the cells in columns BF:BH under the headings 'Question', 'Topic' and 'MC correct or marks available'
- The colours of the 'Topic' cells in column BG will auto-update as per the topic colours in column BN
- Now complete 'Task Summary' section in BL52

	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV
51																	
52	Question details						Task Summary (limit: 11 topics and 40 questions)										
53	Question	Topic	MC correct or marks available				Count	Questions	Topic	marks	%	Topic description					
54	1	9.1	D				2	8,10	8.2	2	7%	Adding vectors in one and two dimensions					
55	2	9.5	C				1	9	8.3	1	4%	Subtracting vectors in one and two dimensions					
56	3	9.5	B				2	12,14	8.4	5	19%	Vector components					
57	4	9.1	A				3	1,4,15ab	9.1	4	15%	Displacement, speed and velocity					
58	5	9.2	B				2	5,11	9.2	2	7%	Acceleration					
59	6	9.5	D				2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over					
60	7	9.3	B				1	15cd	9.4	3	11%	Equations for uniform acceleration					
61	8	8.2	A				3	2,3,6	9.5	3	11%	Vertical motion					
62	9	8.3	B														
63	10	8.2	A														
64	11	9.2	C														
65	12	8.4	A														
66	13	9.3	6				Totals	16		27	100%						
67	14	8.4	4														
68	15ab	9.1	2														
69	15cd	9.4	3														
70																	

The process in Excel

- If including comments: Mark all tasks by hand before entering the marks so that you get an idea of general feedback or advice to be offered for each question
- Adjust the 'General advice for each question' section as required from AX39
- Adjust the 'Task description' in AY50
- Adjust the advice for achieving 'Full marks' on each question from AY54 down
- Adjust the advice for 'Full marks not awarded' on each question from AZ54
- Comments will be generated for each student from AX9 when marks are entered

	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG
39	General advice for achievement									
40	<50%	A great effort								
41	>50%	Well done								
42										
43	0	You have demonstrated some understanding								
44	0.45	You have demonstrated a good foundation in your understanding								
45	0.5	You have demonstrated a good foundation in your understanding								
46	0.6	You have demonstrated a good understanding								
47	0.7	You have demonstrated a very good understanding								
48	0.9	You have demonstrated an excellent understanding								
49	1	You have demonstrated an excellent understanding								
50	Task description	of the content covered in the vectors and motion topics.								
51										
52	General advice for each question								Question details	
53	Question	Full marks	Full marks not awarded						Question	Topic
54	1	As in Q1, you	As in Q1, rem						1	9.1
55	2	As in Q2, you	As in Q2, rem						2	9.5
56	3	As in Q3, you	As in Q3, rem						3	9.5
57	4	As in Q4, you	As in Q4, rem						4	9.1
58	5	As in Q5, you	As in Q5, rem						5	9.2
59	6	As in Q6, you	As in Q6, rem						6	9.5
60	7	As in Q7, you	As in Q7, rem						7	9.3
61	8	As in Q8, you	As in Q8, rem						8	8.2
62	9	As in Q9, you	As in Q9, rem						9	8.3
63	10	As in Q10, yo	As in Q10, re						10	8.2
64	11	As in Q11, yo	As in Q11, re						11	9.2
65	12	As in Q12, yo	As in Q12, re						12	8.4

The process in Excel

- Once your task details are entered, the question numbers, their topics and the correct MC options or full marks per question will appear in rows 2, 3 and 8 respectively
- Do not edit rows 1-8; edit details from cell BF52 as shown on previous slides
- If any columns are not required, leave them blank (deleting will mess up formulae)
- Unhide columns between X and AS if more question columns are required
- Enter the multiple choice options and marks awarded for each student from column E
- Any deductions (i.e. sig figs, directions, units etc) are entered as negative values
- Enter '0' for any omitted multiple choice questions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	AS	AT	AU		
1		class		name	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	sigfigs	d	u		
2					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15ab	15cd									
3	Motion tests (Ch 8-9)				9.1	9.5	9.5	9.1	9.2	9.5	9.3	8.2	8.3	8.2	9.2	8.4	9.3	8.4	9.1	9.4									
Average				####	0	####	####	####	####	####	####	####	####	####	####	0	5	3	2	1	####	####	####	####	####	####	-1	0	
Lower Quartile				####	0	####	####	####	####	####	####	####	####	####	####	####	0	4	2	1	0	####	####	####	####	####	####	-1	0
Median				####	0	####	####	####	####	####	####	####	####	####	####	####	0	5	4	2	1	####	####	####	####	####	####	-1	0
7				Upper Quartile	####	0	####	####	####	####	####	####	####	####	####	0	5	4	2	2	####	####	####	####	####	####	0	0	
8	Teacher	Class	ID Code	Name	D	C	B	A	B	D	B	A	B	A	C	A	6	4	2	3	0	0	0	0	sigfigs	d	u		
9	ROL	10SPH02	STU0001	Student 1	D	C	B	A	B	D	B	A	B	A	C	A	5	4	2	0						-1	0		
10	ROL	10SPH02	STU0002	Student 2	D	C	B	B	B	D	B	A	B	B	D	C	5	4	1	0						0	0		
11	ROL	10SPH02	STU0003	Student 3	D	C	C	C	B	D	B	C	C	A	C	0	5	1	1	0						-1	-1		
12	ROL	10SPH02	STU0004	Student 4	D	C	B	A	B	D	B	A	B	A	C	C	6	4	2	3						-1	0		
13	ROL	10SPH02	STU0005	Student 5	D	C	C	C	B	D	B	C	C	A	C	0	5	1	1	0						-1	0		

The process in Excel

- Columns CH onwards show the % achievement-by-topic and the achievement dots
- Adjust the green cells in CT3:CT5 to set the achievement levels as required

[illegible]

The process in Excel

- If including comments, the cells from AX9 under heading 'auto1' contain formulae for generating an overall achievement comment as per details entered from AX39
- The cells from AY9 down under heading 'auto2' contain formulae for generating advice comments on each question according to marks awarded
- Copy the 'auto2' comments and 'paste as values' into column AZ for editing
- The 'aaaaa...' cells in row 2 are required to mail merge these large text strings

	AX	AY	AZ	BA	BB	BC	BD	BE	BF
39	General advice for achievement								
40	<50%	A great effort							
41	>50%	Well done							
42									
43	0	You have demonstrated some understanding							
44	0.45	You have demonstrated a good foundation in your understanding							
45	0.5	You have demonstrated a good foundation in your understanding							
46	0.6	You have demonstrated a good understanding							
47	0.7	You have demonstrated a very good understanding							
48	0.9	You have demonstrated an excellent understanding							
49	1	You have demonstrated an excellent understanding							
50	sk description	of the content covered in the vectors and motion topics.							
51									
52	General advice for each question								
53	Question	Full marks	Full marks not awarded						Que
54	1	As in Q1, you	As in Q1, rem						
55	2	As in Q2, you	As in Q2, rem						
56	3	As in Q3, you	As in Q3, rem						
57	4	As in Q4, you	As in Q4, rem						

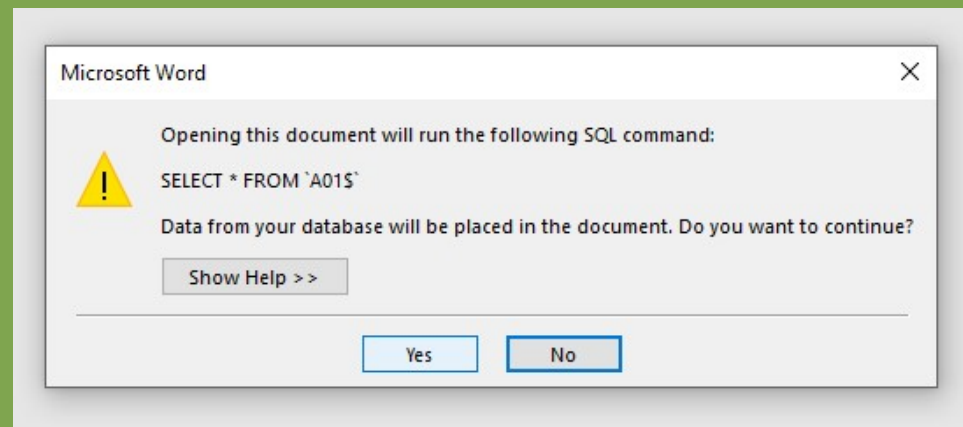
	A	B	C	D	AX	AY	AZ	BA	BB	BC	BD	BE
1		class		name	c1		c2	redo	c3	c4		total
2					aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaa	aaaa	aaaa	aaaa	total
3	Motion tests											27
4	(Ch 8-9)			Average								18
5				Lower Quartile								15
6				Median								19
7				Upper Quartile								22
8	Teacher	Class	ID Code	Name	auto1	auto2	edit	redo	prep	redo		Score
9	ROL	10SPH02	STU0001	Student 1	Well done	As in Q1,	As in Q1,	15cd	I	Plea		22
10	ROL	10SPH02	STU0002	Student 2	Well done	As in Q1,	As in Q1,	15bc	I	Plea		18
11	ROL	10SPH02	STU0003	Student 3	A great	As in Q1,	As in Q1,	14,1	I	Plea		12
12	ROL	10SPH02	STU0004	Student 4	Well done	As in Q1,	As in Q1,	none	I	Plea		25
13	ROL	10SPH02	STU0005	Student 5	Well done	As in Q1,	As in Q1,	none	I	Plea		21
14	ROL	10SPH02	STU0006	Student 6	Well done	As in Q1,	As in Q1,	15bd	I	Plea		19
15	ROL	10SPH02	STU0007	Student 7	Well done	As in Q1,	As in Q1,	none	I	Plea		23

The process in Word

- Download the Word template:

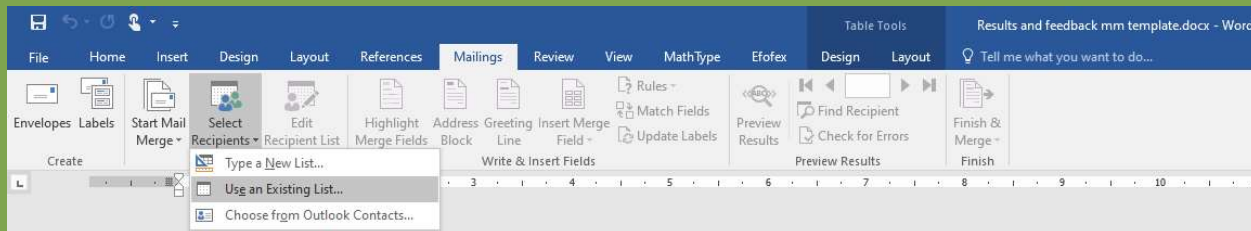
<https://github.com/clairerollinson/auto-feedback-for-students>

- Leave the saved Excel file open and then open the saved Word file (otherwise you will be restricted to 'Read only' access when you try to re-open the Excel file)
- If Word tries to connect to the Excel file to read the data, select "Yes" from the dialog box if the connection is correct or "No" to connect manually.



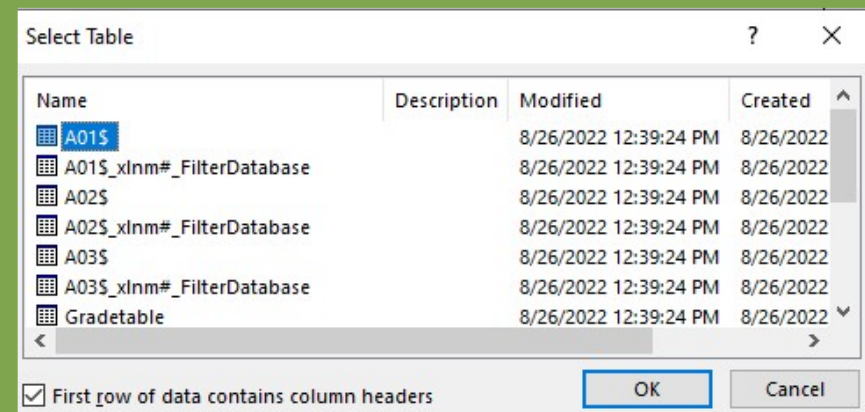
The process in Word

- On the Mailings tab, select “Select Recipients” and “Use an Existing List...”
- Navigate to your saved Excel file, select the desired tab (i.e. “A01\$”) and press OK
- Be patient; Word may take a minute or two make the connection



The screenshot shows the Microsoft Word interface with the 'Mailings' tab selected. The 'Select Recipients' dropdown menu is open, showing options: 'Type a New List...', 'Use an Existing List...', and 'Choose from Outlook Contacts...'. The 'Use an Existing List...' option is selected. Below the menu, the document content is visible, including a header for 'Year 10 Physics Semester 2 2022' and a table with columns 'Ch', 'Description', 'Qns', and 'Ma'.

Ch	Description	Qns	Ma
8.2	Adding vectors in one and two dimensions	8,10	
8.3	Subtracting vectors in 1 and 2 dimensions	9	




The 'Select Table' dialog box is shown, displaying a list of tables. The table 'A01\$' is selected. The dialog box includes columns for Name, Description, Modified, and Created. The 'First row of data contains column headers' checkbox is checked.

Name	Description	Modified	Created
A01\$		8/26/2022 12:39:24 PM	8/26/2022
A01\$_xlNm#_FilterDatabase		8/26/2022 12:39:24 PM	8/26/2022
A02\$		8/26/2022 12:39:24 PM	8/26/2022
A02\$_xlNm#_FilterDatabase		8/26/2022 12:39:24 PM	8/26/2022
A03\$		8/26/2022 12:39:24 PM	8/26/2022
A03\$_xlNm#_FilterDatabase		8/26/2022 12:39:24 PM	8/26/2022
Gradetable		8/26/2022 12:39:24 PM	8/26/2022

- In the Word file, adjust the task title and details in the columns under the headings 'Ch', 'Description', 'Qns' and 'Marks available' by copying from the 'Task Summary' in Excel
- Don't edit any of the cells with codes (i.e. <<name>>) or the headings of the columns in the linked Excel file

	16		27	100%
--	----	--	----	------

<div>  <div> Year 10 Physics Semester 2 2022 Test 1: Vectors and Motion Name: «name» Class: «class» </div> </div>					Achievement			
Ch	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	«s1»	2	«r1»	«g1»	«v1»	«e1»
8.3	Subtracting vectors in 1 and 2 dimensions	9	«s2»	1	«r2»	«g2»	«v2»	«e2»
8.4	Vector components	12,14	«s3»	5	«r3»	«g3»	«v3»	«e3»
9.1	Displacement, speed and velocity	1,4,15ab	«s4»	4	«r4»	«g4»	«v4»	«e4»
9.2	Acceleration				«r5»	«g5»	«v5»	«e5»

The process in Word

- Delete/amend anything as required (i.e. unwanted topic rows, deduction rows, feedback, signature, teacher name, re-do questions etc)
- <<c1>> is the achievement comment
- <<c2>> will output the advice you entered for each question (or not)
- <<c3>> and <<c4>> are optional general advice and redo Q comments (amend on 'Grading' tab in Excel file)
- Don't worry about formatting until reports are generated later

Year 10 Physics Semester 2 2022 Test 1: Vectors and Motion Name: «name» Class: «class»					Achievement			
Ch	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	«s1»	2	«r1»	«g1»	«v1»	«e1»
8.3	Subtracting vectors in 1 and 2 dimensions	9	«s2»	1	«r2»	«g2»	«v2»	«e2»
8.4	Vector components	12,14	«s3»	5	«r3»	«g3»	«v3»	«e3»
9.1	Displacement, speed and velocity	1,4,15ab	«s4»	4	«r4»	«g4»	«v4»	«e4»
9.2	Acceleration	5,11	«s5»	2	«r5»	«g5»	«v5»	«e5»
9.3	Graphing position, velocity & acc ^s over time	7,13	«s6»	7	«r6»	«g6»	«v6»	«e6»
9.4	Equations for uniform acceleration	15cd	«s7»	3	«r7»	«g7»	«v7»	«e7»
9.5	Vertical motion	2,3,6	«s8»	3	«r8»	«g8»	«v8»	«e8»
			«s9»		«r9»	«g9»	«v9»	«e9»
			«s10»		«r10»	«g10»	«v10»	«e10»
			«s11»		«r11»	«g11»	«v11»	«e11»
Deduction for incorrect significant figures			«sigfigs»					
Deduction for incorrect direction			«d»					
Deduction for incorrect units			«u»					
Total marks awarded (out of «task_tot»)			«total»					
Scaled grade			«grade»					


Feedback:

«c1»

- «c2»

«c3»

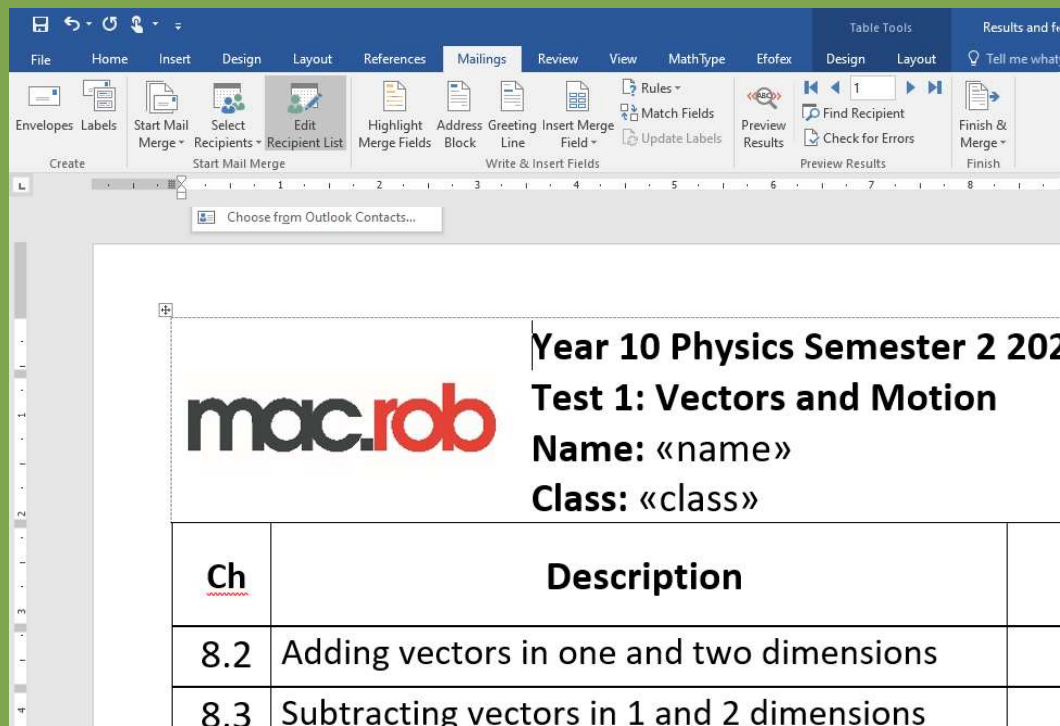
«c4»


(Ms) C Rollinson

Re-do question/s: «redo»

The process in Word

- On the Mailings tab, select “Edit Recipients” and untick the top tick box to deselect all
- Scroll down and select required students in the “name” column
- Click OK

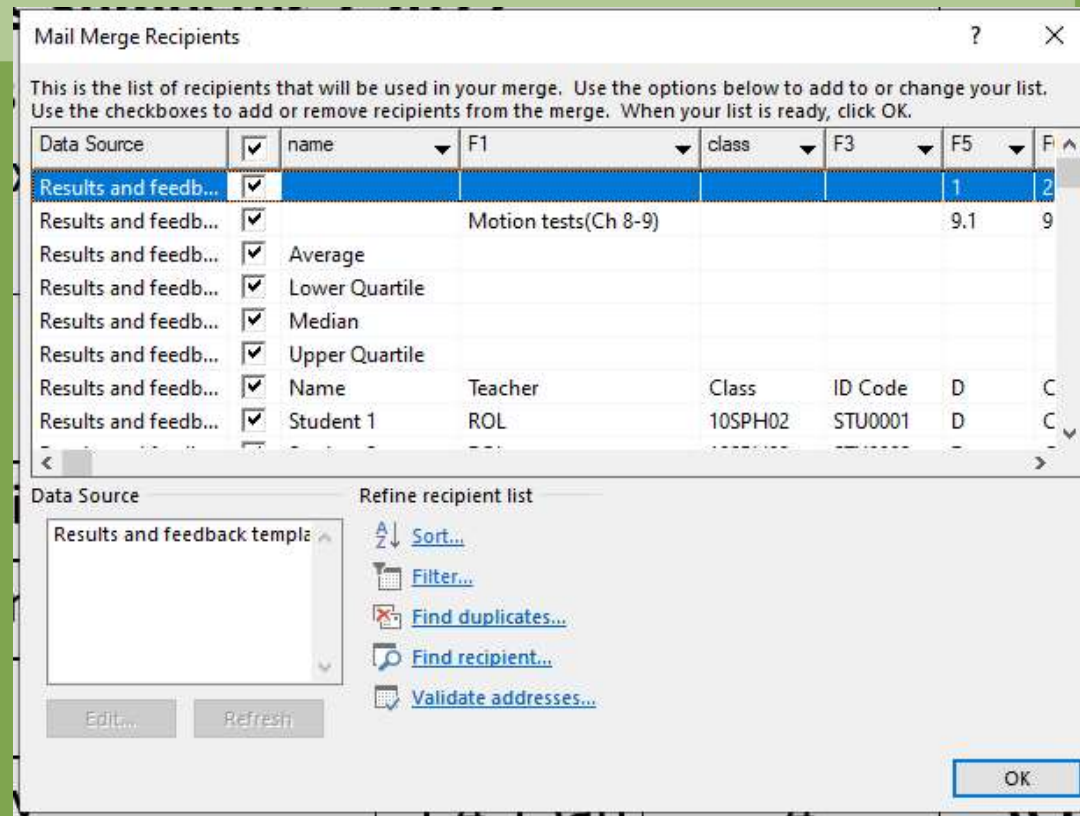


The screenshot shows the Microsoft Word interface with the Mailings tab selected. The 'Edit Recipients' button is highlighted in the ribbon. Below the ribbon, a letter template is visible with the following text:

Year 10 Physics Semester 2 202
Test 1: Vectors and Motion
Name: «name»
Class: «class»

Below the letter template is a table with the following data:

Ch	Description
8.2	Adding vectors in one and two dimensions
8.3	Subtracting vectors in 1 and 2 dimensions

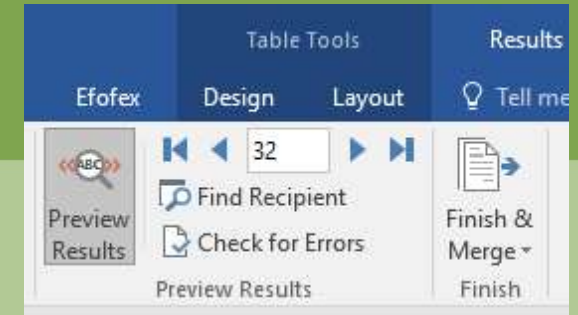


The screenshot shows the 'Mail Merge Recipients' dialog box. The 'Data Source' is set to 'Results and feedback template'. The 'name' column is selected. The 'class' column is also selected. The 'Results and feedback template' is selected in the 'Data Source' list. The 'Refine recipient list' section is visible, showing options like 'Sort...', 'Filter...', 'Find duplicates...', 'Find recipient...', and 'Validate addresses...'. The 'OK' button is at the bottom right.

Data Source	name	F1	class	F3	F5	F6
Results and feedback...	<input checked="" type="checkbox"/>				1	2
Results and feedback...	<input checked="" type="checkbox"/>	Motion tests(Ch 8-9)			9.1	9
Results and feedback...	<input checked="" type="checkbox"/>	Average				
Results and feedback...	<input checked="" type="checkbox"/>	Lower Quartile				
Results and feedback...	<input checked="" type="checkbox"/>	Median				
Results and feedback...	<input checked="" type="checkbox"/>	Upper Quartile				
Results and feedback...	<input checked="" type="checkbox"/>	Name	Teacher	Class	ID Code	D C
Results and feedback...	<input checked="" type="checkbox"/>	Student 1	ROL	10SPH02	STU0001	D C

The process in Word

- On the Mailings tab, select “Preview Results” and use the controls to view each student’s report



Results and feedback mm template.docx - Word

File Home Insert Design Layout References Mailings Review View MathType Efofex Design Layout Tell me... Claire ROLLINSON Share

Envelopes Labels Start Mail Merge Select Recipients Edit Recipient List Highlight Merge Fields Address Block Greeting Line Insert Merge Field Rules Match Fields Update Labels Preview Results Find Recipient Check for Errors Preview Results Finish & Merge Finish

Create Start Mail Merge Recipient List Write & Insert Fields Preview Results

View Merged Data
Plug info from your recipient list into the merge fields to see how the finished document will look.

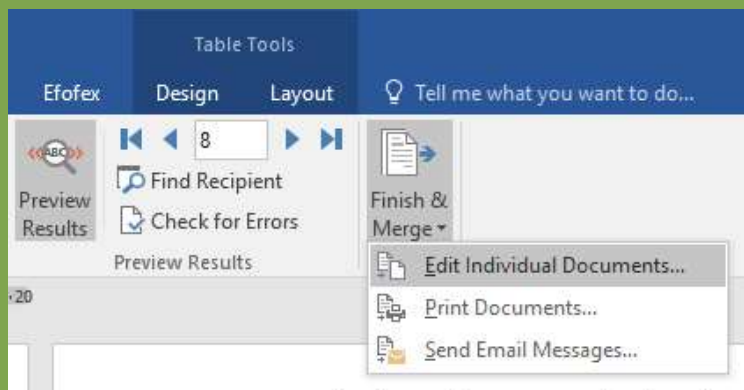
Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 5
Class: 10SPH02

mac.rob

					Achievement			
Ch	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	2	2				●
8.3	Subtracting vectors in 1 and 2 dimensions	9	0	1	●			
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1, 4, 15	1	1				●

The process in Word

- Review each report; if you notice any errors go back and amend in the Excel file
- Once ready to generate the printable reports, select “Finish & Merge” then “Edit Individual Documents”



Results and feedback mm template.docx - Word

File Home Insert Design Layout References Mailings Review View MathType Efofx Design Layout Tell me what you want to do... Claire ROLLINSON Share

Envelopes Labels Start Mail Merge Select Recipients Recipient List Edit Recipient List Start Mail Merge Highlight Merge Fields Address Block Greeting Line Insert Merge Field Match Fields Update Labels Write & Insert Fields Preview Results Find Recipient Check for Errors Finish & Merge Edit Individual Documents... Print Documents... Send Email Messages...

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 1
Class: 10SPH02

Qn	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	2	2				•
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				•
8.4	Vector components	12,14	5	5				•
9.1	Displacement, speed and velocity	1,4,15a	4	4				•
9.2	Acceleration	5,11	2	2				•
9.3	Graphing position, velocity & acc over time	7,13	6	7			•	
9.4	Equations for uniform acceleration	15cd	0	3	•			
9.5	Vertical motion	2,3,6	3	3				•
			0		•			
			0		•			
			0		•			
	Deduction for incorrect significant figures							
	Deduction for incorrect direction		-1					
	Deduction for incorrect units		0					
	Total marks awarded (out of 27)		22					
	Scaled grade		A					

Feedback:
Well done Student 1. You have demonstrated a very good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, you are correctly identifying that constant velocity means $a = 0$ and you are converting between units effectively to solve motion problems.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. $\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of $g = 9.8 \text{ m/s}^2$ near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.
- As in Q8, you are using the head-to-tail method correctly to add vectors in 2 dimensions.
- As in Q9, you are using the head-to-tail method correctly to subtract vectors in 2 dimensions by adding the negative of the second vector.
- As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.

As in Q12, you are correctly identifying that the component of the weight force, mg , which acts parallel to the surface for an object moving down an inclined plane is equal to $mg \sin \theta$, where θ is the angle of the incline above the horizontal.

As in Q13a, remember that acceleration is given by the gradient of a velocity-time graph or simply $a = \Delta v / t = (v - u) / t$. Remember to read axis values and units carefully and to include directions with all vector quantities.

As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.

As in Q13b, remember that displacement is given by the area under of a velocity-time graph. Remember to show full working and to read axis values and units carefully.

As in Q13b, you are correctly finding displacement as the area under of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q13c, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.

As in Q13c, you are answering explaining questions clearly and specifically by referring to the wording in the question.

As in Q14, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.

As in Q15a-b, you are converting between km/h and m/s correctly and analysing motion problems effectively.

As in Q15c-d, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will decelerate while braking. Remember to use exact values (or at least 4 decimal places) in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.

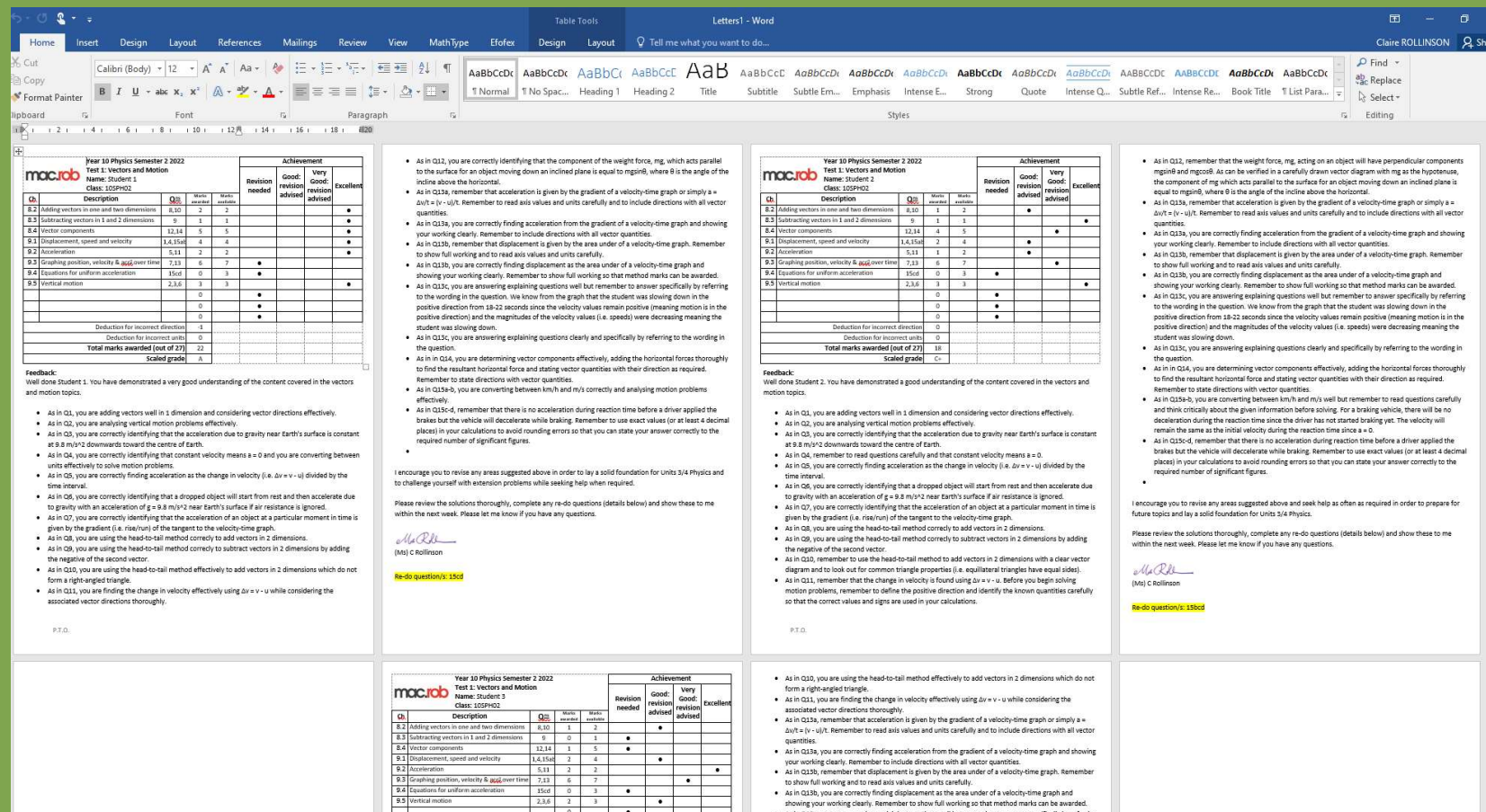
I encourage you to revise any areas suggested above in order to lay a solid foundation for Units 3/4 Physics and to challenge yourself with extension problems while seeking help when required.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

Ms C Rollinson
(Ms) C Rollinson

Re-do question/s: 15cd

- A Word file called “Letters1” will be generated containing all reports
- Format as required for printing
- You may need to delete or insert blank pages to separate the reports



Troubleshooting with Excel and Word

- Seeing ‘Read-only access’ message when trying to open Excel: save and close Word and Excel then re-open Excel file first, followed by Word file.
- If the achievement dots are appearing as zeros, save and close Word and Excel. Open the Excel file first and then the Word file to reconnect.
- The extra bullet point in the comments can be removed by deleting the last blank line in the “edit” cell for each student in column AY.
- Use Alt+Enter to insert a blank line in a cell.
- If any comments are clipped, check that the “aaaa....” cells are in row 2 as in the template.
- Anything else, email rol@macrob.vic.edu.au!

Letters1 - Word

File Home Insert Design Layout References Mailings Review View MathType Efofox Design Layout

Read Mode Print Layout Web Layout Views Show Zoom 100%

One Page Multiple Pages Page Width New Window Arrange All Split View Side by Side Synchronous Scrolling Reset Window Position Window

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 1
Class: 10P412

Qs	Description	Qs	Marks available	Revision needed	Good revision advised	Very Good revision advised	Excellent
B.2	Adding vectors in 1 and 2 dimensions	8.00	2				
B.3	Subtracting vectors in 1 and 2 dimensions	9	1				
B.4	Vector components	12.00	5				
B.5	Displacement, speed and velocity	14.500	4				
B.7	Acceleration	5.51	2				
B.9	Graphing position, velocity & <u>acceleration</u> time	7.53	2				
B.4	Equations for uniform acceleration	15.00	3				
B.5	Vertical motion	28.8	8				
Deductions for incorrect direction				-1			
Deductions for incorrect units				0			
Total marks awarded (out of 77)				22			
Scaled indicative grade				A			

Feedback:

- Well done Student 1.
- You have demonstrated a very good understanding of the content covered in the vectors and motion topics.
- As in Q2, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q2, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, you are correctly identifying that constant velocity means $a = 0$ and you are converting between units effectively to solve motion problems.
- As in Q5, you are correctly finding acceleration as the change in velocity ($\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of $g = 9.8 \text{ m/s}^2$ near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. the slope) of the tangent to the velocity-time graph.
- As in Q8, you are using the head-to-tail method correctly to add vectors in 2 dimensions.
- As in Q9, you are using the head-to-tail method correctly to subtract vectors in 2 dimensions by adding the negative of the second vector.
- As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.
- As in Q11, you are finding the change in velocity effectively using $\Delta v = v - u$ while considering the associated vector directions thoroughly.
- As in Q12, you are correctly identifying that the component of the weight force, mg , which acts parallel to the surface for an object moving down an inclined plane is equal to $mg \sin \theta$, where θ is the angle of the incline above the horizontal.

P.T.O.

As in Q12, remember that acceleration is given by the gradient of a velocity-time graph or simply $a = \Delta v / t = (v - u) / t$. Remember to read axis values and units carefully and to include directions with all vector quantities.

As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q13b, remember that displacement is given by the area under a velocity-time graph. Remember to show full working and to read axis values and units carefully.

As in Q13c, you are correctly finding displacement as the area under a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q13d, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18.22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.

As in Q13e, you are answering explaining questions clearly and specifically by referring to the wording in the question.

As in Q14, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.

As in Q15a-b, you are converting between km/h and m/s correctly and analysing motion problems effectively.

As in Q15c-d, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will decelerate while braking. Remember to use exact values for at least 4 decimal places in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.

I encourage you to review any areas suggested above in order to lay a solid foundation for Units 3/4 Physics and to challenge yourself with extension problems while seeking help when required.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

Mr C. Robinson
(Mr) C. Robinson

No-Go question(s): 15ad

As in Q12, remember that the weight force, mg , acting on an object will have perpendicular components $mg \sin \theta$ and $mg \cos \theta$. As can be verified in a carefully drawn vector diagram with mg as the hypotenuse, the component of mg which acts parallel to the surface for an object moving down an inclined plane is equal to $mg \sin \theta$, where θ is the angle of the incline above the horizontal.

As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph or simply $a = \Delta v / t = (v - u) / t$. Remember to read axis values and units carefully and to include directions with all vector quantities.

As in Q13b, you are correctly finding displacement as the area under a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q13c, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18.22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.

As in Q13d, you are answering explaining questions clearly and specifically by referring to the wording in the question.

As in Q14, you are determining vector components well but remember to only add the horizontal forces to find the resultant horizontal force and remember to state directions with vector quantities.

As in Q15a-b, you are converting between km/h and m/s well but remember to read questions carefully and think critically about the given information before solving. For a braking vehicle, there will be no deceleration during the reaction time since the driver has not started braking yet. The velocity will remain the same as the initial velocity during the reaction time since $a = 0$.

Page 1 of 57 21906 words English (Australia)

Troubleshooting with Google Sheets

- Word cannot connect to Google Sheets for the mail merge
- To use a Google Sheets file, select File > Download > Microsoft Excel (.xlsx) to download and save a copy to your hard drive
- Connect to the saved file from Word as described from slide 11 onwards
- Anything questions, email rol@macrob.vic.edu.au!

Letters1 - Word

File Home Insert Design Layout References Mailings Review View MathType Efofox Design Layout

Read Mode Print Layout Web Layout Views Show Zoom 100%

One Page Multiple Pages Page Width Window Arrange Split View Side by Side Synchronous Scrolling Reset Window Position

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 1
Class: 10P4H2

Qs	Description	Qs	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
B.2	Adding vectors in one and two dimensions	8.00	7				
B.3	Subtracting vectors in 1 and 2 dimensions	8.00	7				
B.4	Vector components	12.00	5				
B.5	Displacement, speed and velocity	14.500	4				
B.7	Acceleration	5.50	7				
B.9	Drawing position, velocity & <u>acceleration</u> time	7.50	7				
B.4	Equations for uniform acceleration	15.00	3				
B.5	Vertical motion	28.00	8				
Deduction for incorrect direction				-1			
Deduction for incorrect units				0			
Total marks awarded (out of 77)				22			
Scaled indicative grade				A			

Feedback:

- Well done Student 1.
- You have demonstrated a very good understanding of the content covered in the vectors and motion topics.
- As in Q2, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q2, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, you are correctly identifying that constant velocity means $a = 0$ and you are converting between units effectively to solve motion problems.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. $\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of $g = 9.8 \text{ m/s}^2$ near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. the slope) of the tangent to the velocity-time graph.
- As in Q8, you are using the head-to-tail method correctly to add vectors in 2 dimensions.
- As in Q9, you are using the head-to-tail method correctly to subtract vectors in 2 dimensions by adding the negative of the second vector.
- As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.
- As in Q11, you are finding the change in velocity effectively using $\Delta v = v - u$ while considering the associated vector directions thoroughly.
- As in Q12, you are correctly identifying that the component of the weight force, w_{\parallel} , which acts parallel to the surface for an object moving down an inclined plane is equal to $mg \sin \theta$, where θ is the angle of the incline above the horizontal.

P.T.O.

As in Q14, remember that acceleration is given by the gradient of a velocity-time graph or simply $a = \Delta v / t = (v - u) / t$. Remember to read axis values and units carefully and to include directions with all vector quantities.

As in Q14, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.

As in Q15, remember that displacement is given by the area under a velocity-time graph. Remember to show full working and to read axis values and units carefully.

As in Q16, you are correctly finding displacement as the area under a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q17, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.

As in Q18, you are answering explaining questions clearly and specifically by referring to the wording in the question.

As in Q19, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.

As in Q20-a, you are converting between km/h and m/s correctly and analysing motion problems effectively.

As in Q20-b, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will decelerate while braking. Remember to use exact values for at least 4 decimal places in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.

I encourage you to revise any areas suggested above in order to lay a solid foundation for Units 3/4 Physics and to challenge yourself with extension problems while seeking help when required.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

M. C. Robinson
(Mr) C. Robinson

No-Go question(s): 15a

As in Q12, remember that the weight force, w , acting on an object will have perpendicular components w_{\parallel} and w_{\perp} . As can be verified in a carefully drawn vector diagram with w as the hypotenuse, the component of w which acts parallel to the surface for an object moving down an inclined plane is equal to $w \sin \theta$, where θ is the angle of the incline above the horizontal.

As in Q12, remember that acceleration is given by the gradient of a velocity-time graph or simply $a = \Delta v / t = (v - u) / t$. Remember to read axis values and units carefully and to include directions with all vector quantities.

As in Q14, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.

As in Q15, remember that displacement is given by the area under a velocity-time graph. Remember to show full working and to read axis values and units carefully.

As in Q16, you are correctly finding displacement as the area under a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.

As in Q17, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.

As in Q18, you are answering explaining questions clearly and specifically by referring to the wording in the question.

As in Q19, you are determining vector components well but remember to only add the horizontal forces to find the resultant horizontal force and remember to state directions with vector quantities.

As in Q20-a, you are converting between km/h and m/s well but remember to read questions carefully and think critically about the given information before solving. For a braking vehicle, there will be no deceleration during the reaction time since the driver has not started to brake yet. The velocity will remain the same as the initial velocity during the reaction time since $a = 0$.

Page 1 of 57 21906 words English (Australia)