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Sports, exercise and health science
Higher level
Paper 1B

28 April 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

Session number

1 hour 45 minutes [Paper 1A and Paper 1B]

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Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- A clean copy of the **SEHS data booklet** is required for this paper.
- The maximum mark for paper 1B is **[25 marks]**.
- The maximum mark for paper 1A and paper 1B is **[65 marks]**.



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Answers written on this page
will not be marked.



Answer **all** questions. Answers must be written within the answer boxes provided.

1. A study examined the effects of two different programmes on strength and cardiovascular endurance, over an eight-week period. 38 participants were divided randomly into two groups:
 - **Mixed programme group:** Each session included both strength training and high-intensity interval training (HIIT).
 - **Alternate programme group:** Alternating between separate sessions of strength training and sessions of high-intensity interval training (HIIT).

Table 1: Weekly training regimen for mixed and alternate programme groups over an eight-week period

Mixed programme group		Alternate programme group	
Pre-programme test (baseline)		Pre-programme test (baseline)	
Week 1	Strength and HIIT	Week 1	Strength
Week 2	Strength and HIIT	Week 2	HIIT
Week 3	Strength and HIIT	Week 3	Strength
Week 4	Strength and HIIT	Week 4	HIIT
Week 5	Strength and HIIT	Week 5	Strength
Week 6	Strength and HIIT	Week 6	HIIT
Week 7	Strength and HIIT	Week 7	Strength
Week 8	Strength and HIIT	Week 8	HIIT
Post-programme test		Post-programme test	

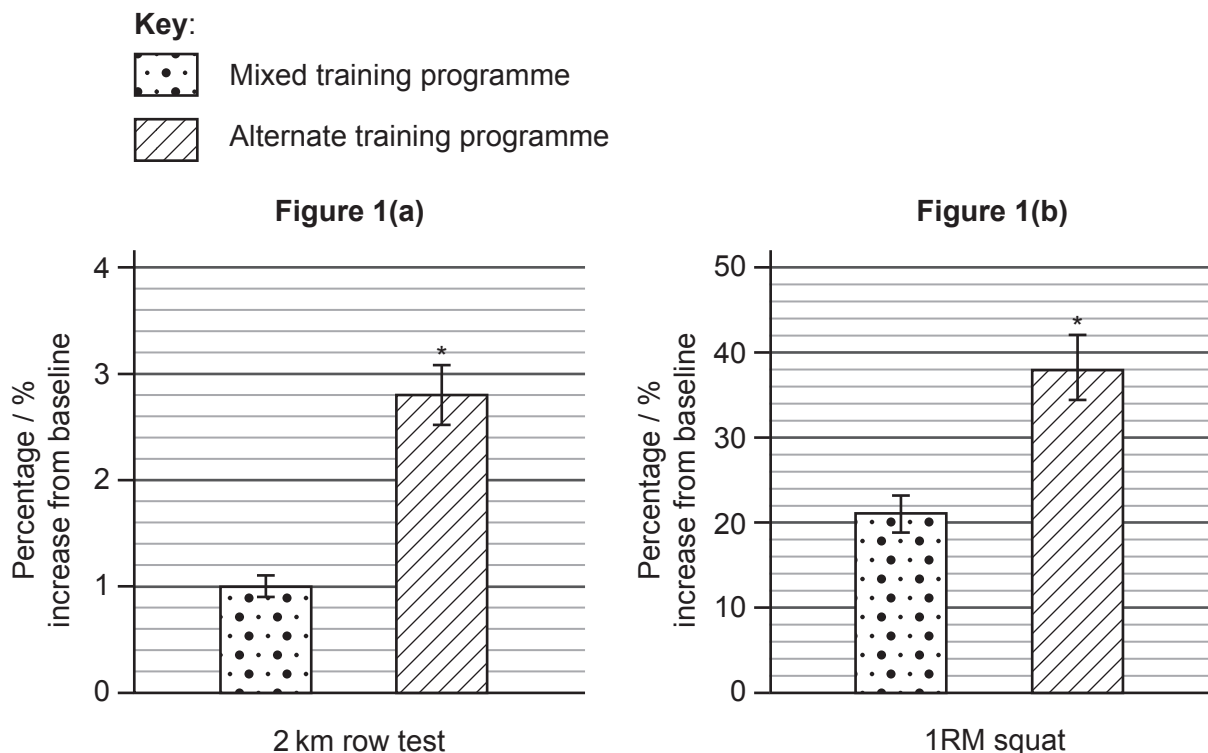
(This question continues on the following page)



(Question 1 continued)

Participants were tested pre-programme (baseline) and post-programme, with 2 km row and one-rep max (1RM) squat tests. The results were self-reported by the participants. The percentage (%) increase from baseline in 2 km row and 1RM are presented in **Figure 1**.

Figure 1: Percentage increase from baseline in (a) 2 km row performance and (b) 1RM squat for mixed and alternate training programmes



* indicates statistically significant result ($p < 0.05$) error bars show the standard deviation

- (a) State which training programme showed the greatest improvement in 2 km row performance.

[1]

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- (b) Calculate the difference in the percentage increase from baseline for the 1RM squat between the mixed and alternate programmes.

[1]

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(This question continues on the following page)



(Question 1 continued)

Physical fitness refers to the ability to perform aspects of sport along with daily activities without undue fatigue.

- (c) Using the data provided, deduce whether the mixed training programme or the alternate training programme is more effective for improving physical fitness. [3]

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- (d) Using **Figure 1(a)** and **Figure 1(b)**, evaluate the study design. [4]

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(Question 1 continued)

- (e) Before the study, participants' diet was controlled for energy content, nutrient balance and water. Suggest **four** other variables that could be controlled in this study to ensure valid and reliable results.

[4]

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- (f) Initially, the study recruited 141 participants. However, only 38 completed the full eight-week programme and reported their test results. Suggest **two** strategies the investigators could use to improve retention rates in future studies.

[2]

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2. Demographic data of the 38 participants that completed the study in question 1 is provided in **Table 2**.

Table 2: Demographic data of study participants ($n = 38$)

Demographic	Mean (standard deviation)
Age (years)	35.31 (± 7.4)
Height (m)	1.75 (± 9.5)
Mass (kg)	81.3 (± 11.6)
BMI (mass/height ²)	26.3 (± 1.9)

- (a) Suggest why study design includes randomizing participants. [1]

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- (b) Suggest **two** ways to improve the reliability of the BMI calculation. [2]

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- (c) Investigators claim that height was measured more reliably than weight because it has a lower standard deviation. Discuss this claim. [2]

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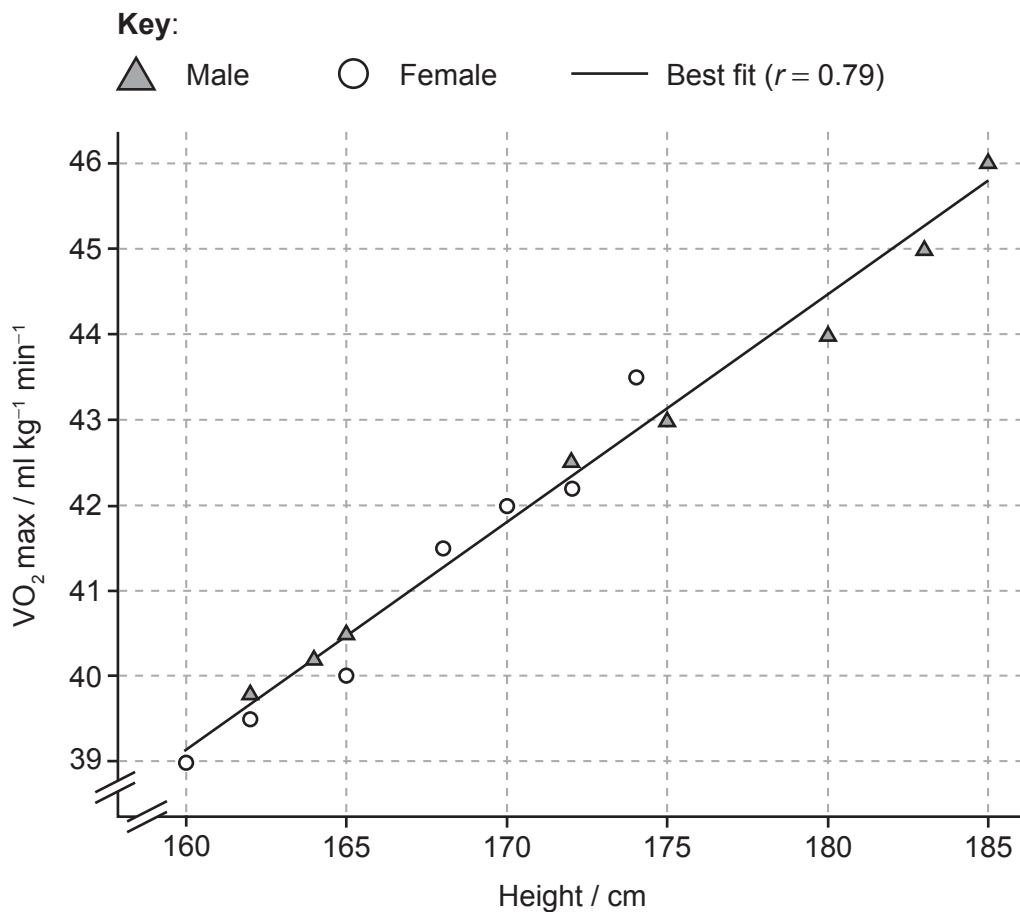
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3. Investigators calculated participants' VO_2max values from their 2 km row time and then plotted these values against their height. The results can be seen in **Figure 2**.

Figure 2: Relationship between participants' height (cm) and VO_2max ($\text{ml kg}^{-1} \text{min}^{-1}$) for 2 km row test



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(Question 3 continued)

- (a) Interpret the relationship between height and VO_2 max shown in **Figure 2**. [3]

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- (b) Evaluate the suitability of the line of best fit drawn in **Figure 2**. [2]

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References:

- Table 1** WOD Science, 2024. *2x your CrossFit performance with this new training method*. [online] Available at: <https://www.wod-science.com/post/2x-your-crossfit-performance-with-this-new-training-method> [Accessed 26 March 2025]. Source adapted.
- Figure 1** WOD Science, 2024. *2x your CrossFit performance with this new training method*. [online] Available at: <https://www.wod-science.com/post/2x-your-crossfit-performance-with-this-new-training-method> [Accessed 26 March 2025]. Source adapted.
- 1.(c)** Wikipedia contributors, 2025. Physical fitness. *Wikipedia, The Free Encyclopedia*, [online] Available at: https://en.wikipedia.org/wiki/Physical_fitness [Accessed 26 March 2025]. Source adapted.



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