ALEXANDER ROAD HIGH SCHOOL

SEPTEMBER 2020

60 MIN

PHYSICAL SCIENCES CONTROL TEST (blue)

JA, PE

TOTAL = 50

GRADE 10

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Instructions

- The question paper consists of 4 questions.
- Answer all the questions.
- Answer section A on the answer sheet provided AND section B on folio sheets.
- A non-programmable calculator may be used.
- Number the answers correctly according to the numbering system.
- Round off to two (2) decimal places where necessary.
- A formula sheet has been provided on the back of the answer sheet.

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SECTION A
- Answer on the answer sheet -

QUESTION 1: Multiple choice

Four possible options are provided as answers to the following questions. Each question has only 1 correct answer. Choose the correct answer and write the letter (A – D) next to the relevant question number (1.1 – 1.10) on the answer sheet.

1.1 L1	Which ONE of the following quantities is NOT a vector? A. Force B. Distance C. Velocity D. Acceleration

1.2 L3	If an object moves 30 m to the right, then 20 m at a bearing of 30° and finally 25 m down, then the correct tail-to-head diagram for the entire motion of the object is…
	A. B.
	C. D.

1.3	A. B. C. D.
1.4	A. B. C. D.
1.5	A. B. C. D.
1.6	A. B. C. D.

TOTAL SECTION A   **[12]**

QUESTION 2: *JA to set 14 marks on VECTORS (2 MCs).*

A fisherman wants to sail from the tip of the Cape of Good Hope to Cape Agulhas (the southern-most tip of Africa). On the day he sets sail, the ocean current is pushing the ship with a force of 350 N east whilst the wind is also pushing the boat with a force of 850 N east.
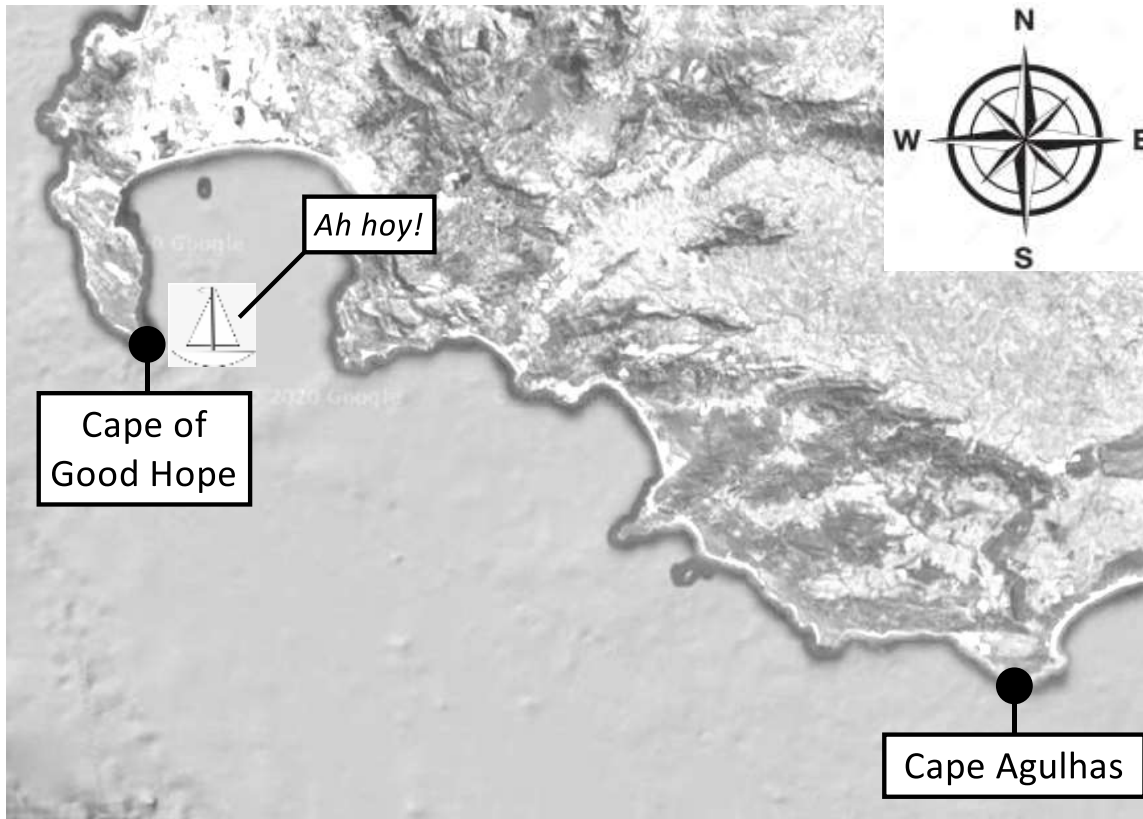
2.1	Define the term *vector*. **L1**	(1)
2.2	Calculate the resultant force exerted on the boat by the ocean current and the wind. Label the resultant force as $F_{weather}$. **L2**	(2)
2.3	In order to counter the effects of the ocean current and the wind, the fisherman sails due south. The motor of the boat produces a force of 3 500 N in magnitude.	
2.3.1	Sketch a vector diagram showing the force of the weather ($F_{weather}$), the force of the boat's motor (F_{motor}) and the resultant force acting on the boat ($F_{resultant}$). It is **not** necessary to draw your diagram to scale. **L2**	(3)
2.3.2	Determine the **magnitude and bearing** of $F_{resultant}$. **L3**	(3)
2.4	According to the fisherman's calculations the bearing of the boat needs to be 130° for him to reach Cape Agulhas. Based on your answer in question 2.3.2, what can the fisherman do to achieve this bearing? **L4**	(1)
		[10]

QUESTION 3: *PE to set 26 marks on motion (3 MCs) - I suggest splitting into a question on ticker tape, a question with a graph and a question on equations of motion mixing definitions into all three.*

3.1		(0)
3.2		(0)
3.3		(0)
3.4		(0)
3.5		(0)
3.6		(0)
3.7		(0)
3.8		(0)
		[20]

QUESTION 4: *PE to set 10 marks on ENERGY (1 MC) - only simple kinetic energy and gravitational potential energy problems.*

4.1		(0)
4.2		(0)
4.3		(0)
4.4		(0)
4.5		(0)
4.6		(0)
4.7		(0)
4.8		(0)
		[8]

TOTAL SECTION B **[38]**