

**Question 21** (4 marks)

In his science fiction novel *From the Earth to the Moon*, Jules Verne describes how to launch a capsule from a cannon to land on the moon. To reach the moon, the capsule must leave the cannon with a speed of  $1.06 \times 10^4 \text{ m s}^{-1}$ . The cannon has a length of 215 m, over which the capsule can be assumed to accelerate constantly.

- (a) Calculate the magnitude of the acceleration required to achieve this speed using this cannon. **2**

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- (b) Referring to your answer in part (a), explain why Jules Verne’s method is unsuitable for sending a living person to the moon. **2**

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