Question 21
Marks

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 1.06×10^4 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**

$v = u + at$ $a = 1.06 \times 10^4 \div 215 = 49.3$ N

$at = uv$

$a = \frac{uv}{t}$

(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**

because the forces ~~required~~ involved in the magnitude of the acceleration are too great for humans, and it doesn't account for the human's weight in the capsule.