Answer **all** the questions in the spaces provided.

1 **(a)** Define *gravitational field strength*.

.....

.....[1]

(b) The nearest star to the Sun is Proxima Centauri.
This star has a mass of 2.5×10^{29} kg and is a distance of 4.0×10^{13} km from the Sun.
The Sun has a mass of 2.0×10^{30} kg.

(i) State why Proxima Centauri may be assumed to be a point mass when viewed from the Sun.

.....

.....[1]

(ii) Calculate

1. the gravitational field strength due to Proxima Centauri at a distance of 4.0×10^{13} km,

field strength = ... $N\,kg^{-1}$ [2]

2. the gravitational force of attraction between the Sun and Proxima Centauri.

force = ... N [2]

(c) Suggest quantitatively why it may be assumed that the Sun is isolated in space from other stars.

.....

.....

.....[2]

[Total: 8]