3 **(a)** Define gravitational field at a point.

.....

..... [1]

(b) Fig. 3.1 shows an isolated point mass of mass *M*.

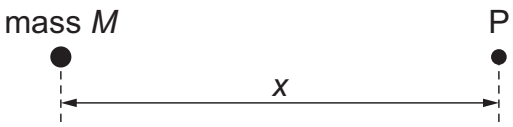

Fig. 3.1

Point P is at distance *x* from the point mass.

(i) By considering the force exerted by the point mass on a test mass of mass *m* placed at P, derive an equation for the gravitational field strength *g* at P, in terms of *M* and *x*. Identify any other symbols you use.

[2]

(iii) Point Q is at distance $\frac{x}{2}$ from the point mass, on the opposite side of the mass from P, as shown in Fig. 3.2.

Fig. 3.2

Compare the gravitational field at Q with that at P.

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.....

..... [2]