13. Gravitational Fields

13.1 Gravitational field

Paper 4

Marking Scheme

Q1.

(a)	force per unit mass	**B1**

Q2.

(a)(i)	force per unit mass	**B1**

Q3.

(a)(i)	direction of the force acting on a (test) mass placed at the point	**B1**
(b)(ii)	gravitational force is (always) attractive **or** gravitational force (always) acts towards the centre of the sphere	**B1**
	force is in opposite direction to displacement **or** at a point to the right of the centre, force acts to the left **or** at a point to the left of the centre, force acts to the right	**B1**

Q4.

(a)	force per unit mass	**B1**
(b)(i)	lines drawn are radial from the surface	**B1**
	arrows show pointing towards planet	**B1**

Q5.

(a)	force per unit mass	**B1**

Q6.

(a)	(gravitational) force per unit mass	**B1**
(b)(iii)	force per unit mass = 3.73 – 0.0171 = 3.71 N kg^{-1}	**A1**

Q7.

(a)(i)	region (of space)	**B1**
	where a particle experiences a force	**B1**
(a)(ii)	force per unit mass	**B1**

Q8.

(a)(i)	direction of force on a (small test) mass **or** path in which a (small test) mass will move	**B1**

Q9.

(a)(i)	force per unit mass	**B1**
(a)(ii)	acceleration = F/m, field strength = F/m, so equal	**B1**