CIRCULAR MOTION OF AN OBJECT ON A STRING

Fig. 4.1 illustrates an object on a string being whirled anticlockwise in a vertical circle.
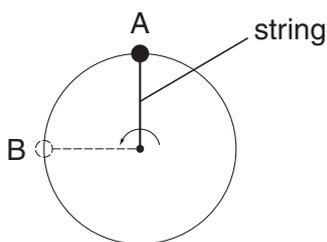

Fig. 4.1

The lowest point of the circle is a small distance above the ground. The diagram shows the object at the top A of the circle, and at B, when it is at the same height as the centre of the circle.

(a) On Fig. 4.1, mark clearly

    (i) the force of the string on the object

        1.   at A,

        2.   at B.   [2]

    (ii) the path the object would take until it hit the ground, if the string broke

        1.   at A,

        2.   at B.   [3]

(b) The mass of the object is 0.05 kg. At A, the tension in the string is 3.6 N.

    (i) Calculate the weight of the object.

                                      weight = ... [1]

    (ii) Calculate the total force on the object at A.

                                        total force = ... [2]

[Total: 8]

(a) **(i)** 1.   force marked towards centre   B1
           2.   force marked towards centre   B1

     (ii) 1.   clearly horizontal at start to left or right   M1
                 horizontal <u>to the left</u> curving down to reach ground to left of A   B1
           2.   vertically down, not necessarily to reach ground   B1

(b) Allow use of g = 9.81 or 9.8 throughout

    (i) 0.5 N   B1

    (ii) 4.1 N or 3.1 N   e.c.f. from **(i)**   C1
            4.1 N   e.c.f. from **(i)**   A1

[8]