

1.

- (a)(i) speed is distance per unit time / distance / time B1
- (ii) velocity is the displacement per unit time / displacement / time B1
- (iii) speed is a scalar, velocity is a vector B1
 velocity has a direction B1
 (speed has magnitude, velocity had magnitude and direction scores 2)
- (b)(i) 1 speed = $(40 \times \pi) / (105 \times 2)$ C1
 = $0.60 \text{ (m s}^{-1}\text{)}$ allow 1 s.f. A1
- 2 velocity = $40 / 105$ C1
 = $0.38 \text{ (m s}^{-1}\text{)}$ A1
- (ii) 1 $0.60 \text{ (m s}^{-1}\text{)}$ allow ecf ((b)(i)) A1
- 2 0 A1
 suitable comment for 2 e.g. there is no displacement B1
- (c) different magnitudes B1
 different directions B1
 directions:
 the average velocity is along the diameter / upwards B1
 the instantaneous velocity is tangent to the circle / to the left B1
 magnitudes:
 instantaneous velocity equals average speed B1
 average velocity is less as displacement is less B1

2.

- (a) energy and power S B1
 velocity and displacement V B1
 (if more than two answers are given then -1 for each one incorrect.
 Minimum score is zero)
- (b)(i) average speed = $200 / 24$ C1
 = $8.3 \text{ (m s}^{-1}\text{)}$ A1
- (ii) velocity is less/speed is greater B1
 displacement (SF) is less than distance (SF) B1