

Mark Scheme Circular Motion Paper Questions Jan 2002—Jan 2010 (old spec)

Question 2		
(a)	<p>speed is magnitude of velocity or speed is a scalar but acceleration (or velocity) is a vector ✓ direction changes continuously ✓ velocity is changing ✓ Q2 Jun 2007 acceleration is rate of change of velocity ✓</p> <p>or</p> <p>speed is magnitude of velocity or speed is a scalar but acceleration (or velocity) is a vector ✓ force (or acceleration) acts towards centre of circle ✓ force (or acceleration) is always perpendicular to velocity or has no component in direction of velocity ✓ force changes direction of velocity but not its magnitude ✓</p>	max 3
(b)	<p>$\omega (= 2\pi f) = 2\pi \times (78/60) = 8.17 \text{ (rad s}^{-1}\text{)} \checkmark$</p> <p>$F \left(= \frac{mv^2}{r} \right) = m\omega^2 r \checkmark$ gives $r \left(= \frac{F}{m\omega^2} \right) = \frac{0.50}{0.10 \times 8.17^2} \checkmark$</p> <p style="text-align: center;">$r = 7.5 \times 10^{-2} \text{ m} \checkmark$</p>	4
	Total	7