

Solutions

Each answer shows the steps, then the **result**.

2.1

- Gravity

2.2

- It increases (lower orbits are faster)

2.3

- $v = \sqrt{4.0 \times 10^7} \approx 6300 \text{ m s}^{-1}$

2.4

- The same (mass cancels)

3.1 B

- the central mass and the orbital radius

3.2 B

- a larger orbit has a longer period

3.3

(a)

- B is slower (larger r gives smaller v)

(b)

- $T^2 \propto r^3$, so $T_B/T_A = 2^{3/2} \approx 2.8$ times longer

3.4

(a)

- $v = \sqrt{2.5 \times 10^7} \approx 5000 \text{ m s}^{-1}$

(b)

- No — mass cancels, so the speed is unchanged