

APOLLO

Gravitational fields

SL

Physics

First assessment 2025

11 questions | mark schemes

Mark-scheme answers

Physics SL | Paper 1A | May 2025 TZ1 | Q17 | 1 marks

17. B

Physics SL | Paper 1A | May 2025 TZ2 | Q16 | 1 marks

16. A

Physics SL | Paper 1A | May 2025 TZ3 | Q17 | 1 marks

17. B

Physics SL | Paper 1A | May 2025 TZ3 | Q18 | 1 marks

18. A

4.	a		$g = \frac{G M}{(1.50 \times 10^{11})^2} \checkmark$ $g = 0.0059 \ll \text{N kg}^{-1} \text{ or m/s}^2 \gg \checkmark$		2
4.	b	i	A planet orbits a star describing an elliptical path with the Sun/star at one of the foci $\checkmark$		1
4.	b	ii	ALT 1 One component of the gravitational force creates an acceleration <<that acts in the same direction of the velocity>> $\checkmark$ Therefore KE increases $\checkmark$ ALT 2 According to Kepler's second law, the Earth sweeps out equal areas in equal times $\checkmark$ Therefore, the Earth moves slower/less KE when far from the sun $\checkmark$		2

Question	Answers	Notes	Total
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Mark-scheme answers

Physics SL | Paper 1A | Nov 2025 TZ1 | Q17 | 1 marks

17. A

Physics SL | Paper 1A | Nov 2025 TZ1 | Q18 | 1 marks

18. C

Physics SL | Paper 1A | Nov 2025 TZ3 | Q17 | 1 marks

17. A

Physics SL | Paper 1A | Nov 2025 TZ3 | Q18 | 1 marks

18. C

Physics SL | Paper 1A | Specimen 2025 | Q18 | 1 marks

18. D

3.	a		arrow normal to the orbit towards the Earth ✓		1
3.	b	i	use of $v_{\text{orbital}} = \frac{2\pi r}{T}$ AND either $v_{\text{orbital}} = \sqrt{\frac{GM}{r}}$ or $\frac{mv_{\text{orbital}}^2}{r} = \frac{GMm}{r^2}$ correctly manipulated ✓ «to yield $T^2 = \left(\frac{4\pi^2}{GM}\right)r^3$ »	Allow use of ω .	1
3.	b	ii	$r = \sqrt[3]{\frac{GMT^2}{4\pi^2}} = \sqrt[3]{\frac{6.67 \times 10^{-11} \times 5.97 \times 10^{24} \times (5620)^2}{4\pi^2}}$ ✓ $= 6.83 \times 10^6$ «m» height = «$6.83 \times 10^6 - 6.37 \times 10^6 \Rightarrow 4.6 \times 10^5$ «m» ✓		2

Question	Answers	Notes	Total
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