

XXI Международная астрономическая олимпиада

XXI International Astronomy Olympiad

Болгария, Пампорово-Смолян

5 - 13. X. 2016

Pamporovo-Smolyan, Bulgaria

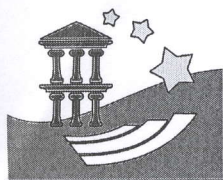
ЯЗЫК
language**English**

Evaluation criteria for problem № $\alpha-1$
of jury member ELENA VCHKOVA BERBEROVSKA (МК)
country

<u>No</u>	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1		CORRECT DISTANCE. IF THE STUDENT DIDN'T USE THE SIMILARITY OF TRIANGLES BUT HAD CALCULATED THE DISTANCE ONE POINT IS GIVEN	1
2		IDEA OF HILL SPHERE OR ANY OTHER LOGICAL IDEA WHY THE OBJECT CANNOT BE SATELLITE ON MARS (EX. FORCE OF GRAVITY, PERIODS ETC.)	1
3		DISTANCE TO THE POSITION OF LAGRANGE POINT. 1 point is given IF THEY HAVEN'T CALCULATED CORRECTLY, OR HAVE SAME MISTAKE IN THE FORMULA	2 _{max}
4		CONCLUSION $A > 1$ OR ANY OTHER METHOD OF COMPARATION BETWEEN QUANTITIES LIKE FORCE, ACCELERATIONS, PERIODS ETC	1
5		CONCLUSION: WRITTEN CORRECT CONCLUSION 1p, NOT CORRECT Op. NO PARTIAL CONCLUSIONS WERE ACCEPTED	1
6		A FIGURE THAT IS NEEDED TO ACCOMPANY THE SOLUTION. IF THE FIGURE DON'T INCLUDE THE SIMILAR TRIANGLES STUDENT WILL RECEIVE ONLY 1p	2 _{max}
7		IF WRONG ISSUE ABOUT POSSIBILITY, BUT CALCULATED THE HYPOTHETICAL PERIOD STUDENT WILL RECEIVE 1p BUT IT WAS CAN NOT MAKE MAX POINT.	0
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	1

8

Jury member signature _____



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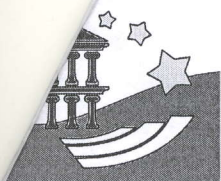
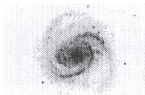
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Язык
language **English**

Evaluation criteria for problem No $\alpha-1$
of jury member Kamelan Chowdhury (IN)
country

<u>No</u>	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1.	1.1.	Correct distance from Mars using either similar triangles or angular diameters.	1
2.	1.2.	Idea to compare with distance with the size of the Hill sphere	1
3.	1.3.	Distance to the position of the Lagrange point	1
4.	1.4 1.4	Conclusion $A > \Lambda$	1
5.	1.5	Conclusion $\ll$ the situation is impossible	1
6.	1.6	A figure that is needed to accompany the solution	2
7.	1.7.	Calculation of a hypothetical period of the satellite	1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature *[Signature]*



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Evaluation criteria for problem No $\alpha-2$
of jury member Kanchan Chowdhury (IN.)
country

<u>No</u>	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1.	2.1.	Explanation of the phenomena	1
2.	2.2.	Understanding to use the law of conservation of ang. momentum	1
3.	2.3	Estimation of Δt from graph	1
4.	2.4	Explanation of what we can neg neglect	1
5.	2.5	Algebraic transformations and correct formula for $\Delta h / \Delta t$	2
6.	2.6	Make conclusion for the sign of Δh	1
7.	2.7	Additional relevant remarks	1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature Kanchan Chowdhury



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Evaluation criteria for problem № $\alpha\beta-3$

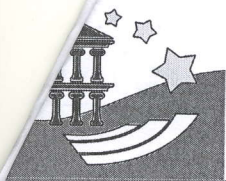
of jury member Kanchan choudhry

(IN)
country

<u>№</u>	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1.	3.1.	$a = 3^{2/3} = 2.08 \text{ a.u.}$	2
2.	3.2	Resolving power of eye	1
3.	3.3	Application of Kepler's 2nd law	2
4.	3.4	Comets 0.5 revolutions = Earth 1.5 revolutions	1
5.	3.5	Use of relevant formulae	1
6.	3.6.	Interpretation of results	1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature

Kanchan choudhry



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Evaluation criteria for problem № 4B-4
of jury member Kanchan Chowdhury (IN)
country

<u>No</u>	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1.	4.1	Timing for observing the phenomenon and phases of moon.	2
2.	4.2	Position of moon & sun	2
3.	4.3.	The Byzantine army saw this phenomenon in front Bulgarian army saw this phenomenon from behind	1
4.	4.4.	Artistic drawing	1
5.	4.5	What data is missing dates of June	1 1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature Kanchan Chowdhury



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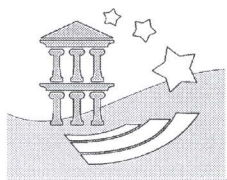
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Evaluation criteria for problem No $\alpha B-5$
of jury member Kanchan Kumar Chowdhry (IN)
country

No	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1.	S.1	Same intensity of light should be registered by the telescope from main belt & Kuiper belt	2
2.	S.2	Introducing the concept of albedo	1
3.	S.3	Expression of intensity	1
4.	S.4	Use of formulae	2
5.	S.5	Final result	1
6.	S.6	Accuracy in answers	1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature Kanchan Kumar Chowdhry



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Evaluation criteria for problem No $\alpha-4$
of jury member Anders Västerberg (SE)
country

No	Abbreviation (if used in table)	Explanations of gradating sub-points	N of points
1		Comet goes from under the right side of the moon Evening	1 1
2		Position of the sun and the moon relative to the sun Gemini or Cancer	1 1
3		The moon in the west or NW and any answer based on this fact	1
4		Artistic drawing	1
5.		Partial solution Full solution (i.e. 2pts)	1 1
		Equivalent correct parts of other ways of solution	8
		Extra conclusions or correct additions (add. to 8 pt)	

Jury member signature

Anders Västerberg