

## Олимпиада Физтех, февраль 2021

### Физика, 11 класс. Ответы к вариантам 11-01, 11-02, 11-03, 11-04

Вар. 11-01	Вар. 11-02	Вар. 11-03	Вар. 11-04
№1	№1	№1	№1
1) $\sin \beta = \frac{2\sqrt{5}}{5}$ $\cos \beta = \frac{\sqrt{5}}{5}, \operatorname{tg} \beta = 2$	1) $\cos \gamma = \frac{3}{\sqrt{10}}$ $\sin \gamma = \frac{1}{\sqrt{10}}, \operatorname{tg} \gamma = \frac{1}{3}$	1) $\sin \beta = \frac{3}{\sqrt{13}}$ $\cos \beta = \frac{2}{\sqrt{13}}, \operatorname{tg} \beta = \frac{3}{2}$	1) $\cos \gamma = \frac{5}{\sqrt{34}}$ $\sin \gamma = \frac{3}{\sqrt{34}}, \operatorname{tg} \gamma = \frac{3}{5}$
2) $a = \frac{3}{4}g$	2) $a = \frac{4}{3}g$	2) $a = \frac{5}{12}g$	2) $a = \frac{8}{15}g$
3) $\frac{M}{m} = \frac{15}{4}$	3) $\frac{M}{m} = 20$	3) $\frac{M}{m} = \frac{65}{64}$	3) $\frac{M}{m} = \frac{136}{81}$
4) $t = \sqrt{\frac{10H}{3g}}$	4) $t = \sqrt{\frac{5H}{2g}}$	4) $t = \sqrt{\frac{26H}{5g}}$	4) $t = \sqrt{\frac{17H}{4g}}$
№2	№2	№2	№2
1) $Q_1 = \frac{11}{36} \nu RT_0$	1) $Q_1 = \frac{15}{16} \nu RT_0$	1) $Q_1 = \frac{24}{25} \nu RT_0$	1) $Q_1 = \frac{63}{160} \nu RT_0$
2) $T_M = \frac{3}{4}T_0$	2) $T_M = \frac{3}{5}T_0$	2) $T_M = \frac{1}{2}T_0$	2) $T_M = \frac{5}{6}T_0$
3) $A_M = -\frac{1}{16} \nu RT_0 < 0$	3) $A_M = -\frac{1}{5} \nu RT_0 < 0$	3) $A_M = -\frac{3}{8} \nu RT_0 < 0$	3) $A_M = -\frac{1}{40} \nu RT_0 < 0$
№3	№3	№3	№3
1) $I_{0R} = \frac{2E}{3R}$	1) $I_{0R} = \frac{3E}{4R}$	1) $I_{0R} = \frac{4E}{5R}$	1) $I_{0R} = \frac{5E}{6R}$
2) $Q = \frac{2}{3}CE^2$	2) $Q = \frac{9}{8}CE^2$	2) $Q = \frac{8}{5}CE^2$	2) $Q = \frac{25}{12}CE^2$
3) $I = \frac{3}{2}I_0$	3) $U = 4I_0R$	3) $U = \frac{5}{4}I_0R$	3) $I = 6I_0$
№4	№4	№4	№4
1) $a_{02} = \frac{1}{6} \frac{B^2 V_0 L^2}{mR}$	1) $a_{02} = \frac{2}{5} \frac{B^2 V_0 L^2}{mR}$	1) $a_{01} = \frac{1}{8} \frac{B^2 V_0 L^2}{mR}$	1) $a_{01} = \frac{1}{12} \frac{B^2 V_0 L^2}{mR}$
2) $V = V_0 / 3$	2) $V = 2V_0 / 3$	2) $V = 2V_0 / 3$	2) $V = 4V_0 / 5$
3) $S = S_0 - \frac{2V_0 R m}{B^2 L^2}$	3) $\Delta S = \frac{5V_0 R m}{3B^2 L^2}$	3) $S = S_0 - \frac{8V_0 R m}{3B^2 L^2}$	3) $\Delta S = \frac{12V_0 R m}{5B^2 L^2}$
№5	№5	№5	№5
1) $x = 36$ см	1) $x = 40$ см	1) $x = 48$ см	1) $x = 56$ см
2) $D_M = 4,5$ см	2) $D_M = 5$ см	2) $D_M = 6$ см	2) $D_M = 7$ см
3) $z = 12$ см от линзы, слева	3) $z = 120/7$ см = 17,1 см от линзы, слева	3) $z = 144/5$ см = 28,8 см от линзы, слева	3) $z = 42$ см от линзы, слева