

**2019 Year 11 Physics**

**Task 9: Investigation - Pendulums**

**Investigation: Validation Test**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Why does changing the starting position not influence the time it takes for the pendulum to complete a period? (2)

1. The equation is derived from 2 equations; Gravitational field strength, and Kepler’s 3rd law show how these two equations combine to show how period is related to gravity. (4)
2. While the changing the mass does not change the period of the pendulum, describe how using a larger mass may reduce the error in your results. (2)

1. Ben has left the physics class, and for something to do on the weekend, travels to Mars. While there he investigates the relationship between period and length on mars. He uses several different lengths, and times how long it takes for the pendulum to swing ten times. His results are presented below. (12)

|  |  |  |
| --- | --- | --- |
| Length | 10 Periods |  |
| (mm) | (seconds) |  |
| 200 | 14.44 |  |
| 400 | 21.5 |  |
| 700 | 28.1 |  |
| 1000 | 32.3 |  |
| 1400 | 37.8 |  |

1. On the graph below plot the length versus the period of the swing. (3)

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1. On the graph below plot the length versus the period of the swing squared. (3)

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1. Draw a line of best fit on the above graph (part (b)). (1)
2. **Using** the line of best fit drawn on part (b) state what the gradient is between the time and the square of the period. (3)
3. The relationship between the gradient (c) and gravity (g) is calculate what the gravity is, when on Mars. (2)

End of Test