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

**Roller Coaster Calculation Guide**

Each person needs to have this (along with the data table) filled out. Therefore, make sure you do all of the calculations and put the results in your table!

Measurements – FIRST HILL

|  |
| --- |
| h1 \_\_\_\_\_\_\_\_\_\_\_\_ h2 \_\_\_\_\_\_\_\_\_\_\_\_ (bottom of first hill)  vi \_\_\_\_\_\_\_\_\_\_\_\_ vf \_\_\_\_\_\_\_\_\_\_\_\_  m \_\_\_\_\_\_\_\_\_\_\_\_ d\_\_\_\_\_\_\_\_\_\_\_\_\_(distance car travels to go down the hill) |

Calculations (1)

Calculate the potential energy at the top of the first hill.

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|  |

Calculate the work done by friction as the car travels over the first hill.

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|  |

Calculate the total mechanical energy of the car at the bottom of the first hill.

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| --- |
|  |

Calculate the potential energy of the car at the bottom of the first hill.

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| --- |
|  |

Determine the kinetic energy of the car at the bottom of the first hill.

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| --- |
|  |

Calculate the velocity of the car at the bottom of the first hill.

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|  |

Measurements – SECOND HILL

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| --- |
| h1 \_\_\_\_\_\_\_\_\_\_\_\_(top of hill) h2 \_\_\_\_\_\_\_\_\_\_\_\_ (bottom of hill)  vi \_\_\_\_\_\_\_\_\_\_\_\_(at top) vf \_\_\_\_\_\_\_\_\_\_\_\_(at bottom)  m \_\_\_\_\_\_\_\_\_\_\_\_ d\_\_\_\_\_\_\_\_\_\_\_\_\_(distance car has traveled so far) |

Calculations (2)

Calculate the work done by friction so far (include any distance it has traveled).

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|  |

Calculate the total mechanical energy of the car at the top of the second hill.

|  |
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|  |

Calculate the potential energy, kinetic energy, and velocity at the top of the second hill.

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|  |

Calculate the total mechanical energy of the car at the bottom of the hill (remember to subtract off work done by friction while traveling down the hill).

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|  |

Calculate the potential energy of the car at the bottom of the hill.

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|  |

Determine the kinetic energy of the car at the bottom of the hill.

|  |
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|  |

Calculate the velocity of the car at the bottom of the hill.

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|  |