Student Name: _____ Date: _____

Period #: _____

Unit 1: Quiz 6

Dimensional Analysis

Which of the following equations are dimensionally correct given the table below?

Quantity	SI Name	Variable name	In terms of fundamental units
Length	Meter (m)	x	* m
Mass	Kilogram (kg)	m	* kg
Time	Second (s)	t	* s
Speed	Speed & Velocity (v)	v	m/s
Force	Newton (N)	F	$\frac{kg \cdot m}{s^2}$
Energy	Joule (J)	E	$\frac{kg \cdot m^2}{s^2}$

* Quantity is a fundamental unit (aka Base Unit) of the SI measurement system

SHOW ALL WORK

1. $v_f = v_o + a^2t^2$

2. $E = \sqrt{m^2v^2}$

3. $v_f^2 = v_o^2 + 2ax^2$

4. $v = (v_o + v_f)/2$

What are the units of the constant (**k**) in the following equations given the table below?

Quantity	SI Name	Variable name	In terms of fundamental units
Length	Meter (m)	x	* m
Mass	Kilogram (kg)	m	* kg
Time	Second (s)	t	* s
Speed	Speed & Velocity (v)	v	m/s
Force	Newton (N)	F	$\frac{kg \cdot m}{s^2}$

* Quantity is a fundamental unit (aka Base Unit) of the SI measurement system

Express your answer in terms of the fundamental units (m, kg, & s) and simplify each answer

1. F = - **k**x

2. $F = \mathbf{k}\frac{m_1 \cdot m_2}{x^2}$