AP Physics 1 Math/Graphing Review Assignment 2026-2027

ABOUT THE COURSE:

Physics is the study of how the world works at a fundamental level. Physics 1 is an in-depth study of physics which mimics the topics covered in many first-semester college physics classes. The goal of the course is to earn college credit by passing the AP exam. This course doesn't simply test what you know, but also how you think. You will not succeed by memorizing formulas (although that will help), by learning specific "tricks" or "shortcuts" or by getting the correct numerical answer without being able to justify your answer and explain how you arrived at it.

PREREQUISITES:

Algebra and geometry are prerequisites for this class and mastery is assumed. If your math skills are weak, you will spend the majority of your time chasing algebra mistakes and won't have time to learn the physics. You should be comfortable manipulating equations that only involve symbols (no numeric values). Chemistry is also a prerequisite for this class. You should be comfortable doing dimensional analysis and metric conversions without having to think about King Henry's beverage of choice. You should have an understanding of the scientific method and how to represent and analyze data graphically.

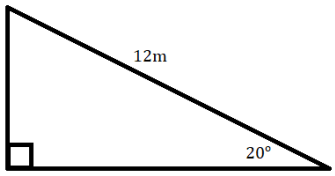
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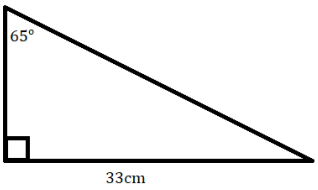
This assignment is intended to review skills you should already have. You should be able to complete the assignment in 1-2 hours without having to consult outside resources. Some problems are more difficult than others, but they all involve basic algebra, geometry and science skills.

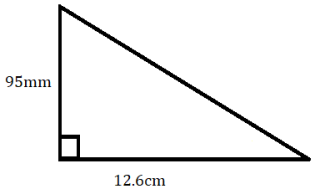
GRADING:

There will be a quiz over the material during the first full week of school. Class time will not be spent reviewing this material, so you should be familiar with everything in this assignment.

Solve the following triangles (i.e. find the unknown angles and sides.)



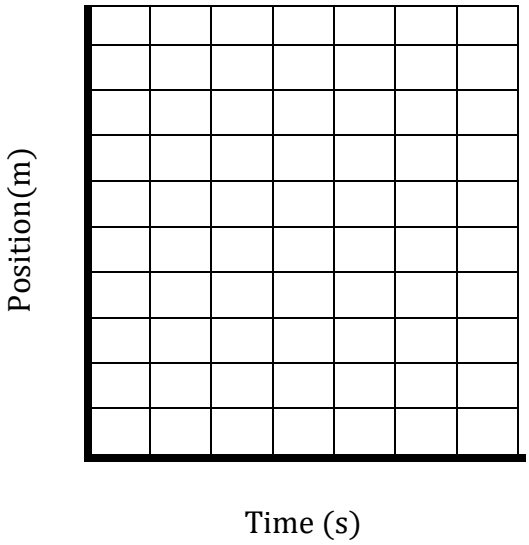




1.	$x_f - x_o = \Delta x$	solve for x_o	$x_o = \frac{1}{3}, \Delta x = \frac{1}{5}$	solve for x_f
2.	$v_o + at = v$	solve for a	$a = -7, t = 2, v = -32$	solve for v_o
3.	$a = \frac{F}{m}$	solve for m	$F = 10, m = \frac{1}{2}$	solve for a
4.	$\frac{(V_1+V_2)}{R_{eq}} = I_T$	solve for V_2	$V_1 = 3, V_2 = 5, I_T = 2$	solve for R_{eq}
5.	$\tau = I\alpha$	solve for α	$I = \frac{1}{4}, \alpha = \frac{2}{9}$	solve for τ
6.	$\theta_o + \frac{1}{2}\alpha t^2 = \theta$	solve for t	$\theta = 2\pi, \theta_o = \frac{\pi}{4}, t = 2$	solve for α
7.	$T = 2\pi\sqrt{\frac{m}{k}}$	solve for k	T=0.2, k=400	solve for m
8.	$x = A\cos(\omega t)$	solve for ω	$x = 15, \omega = 12, t = 0$	solve for A
9.	$E = \frac{1}{2}mv^2 + mgy$	solve for v	E=-260, v=4, g=-10, y=6	solve for m
10.	$F_g = G\frac{m_1 m_2}{r^2}$	solve for r	$F_g = 98, m_1 = 6x10^{24}$, $m_2 = 10, r = 6.4x10^6$	solve for G

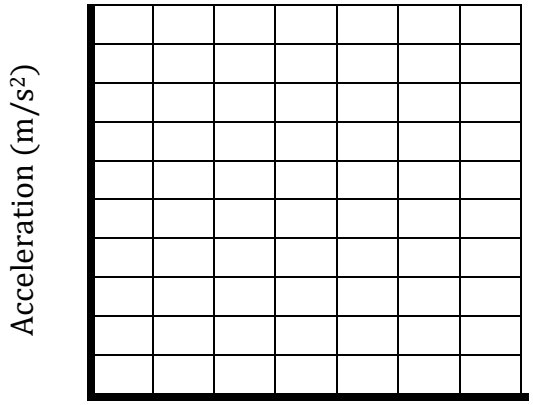
For each of the following data sets, plot the points and draw a best-fit curve. If it is linear, determine the best-fit equation, if it is non-linear, determine the mathematical relationship between the variables

Time (s)	Position (m)
1.0	0.47
2.0	2.14
3.0	3.87
4.0	8.00
5.0	13.50
6.0	18.54

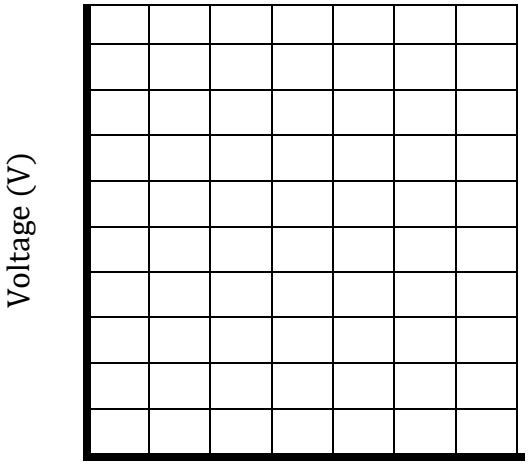


Mass (kg)	Acceleration (m/s^2)
0.05	44.80
0.10	19.20
0.15	15.33
0.20	10.40
0.25	8.64
0.30	6.20

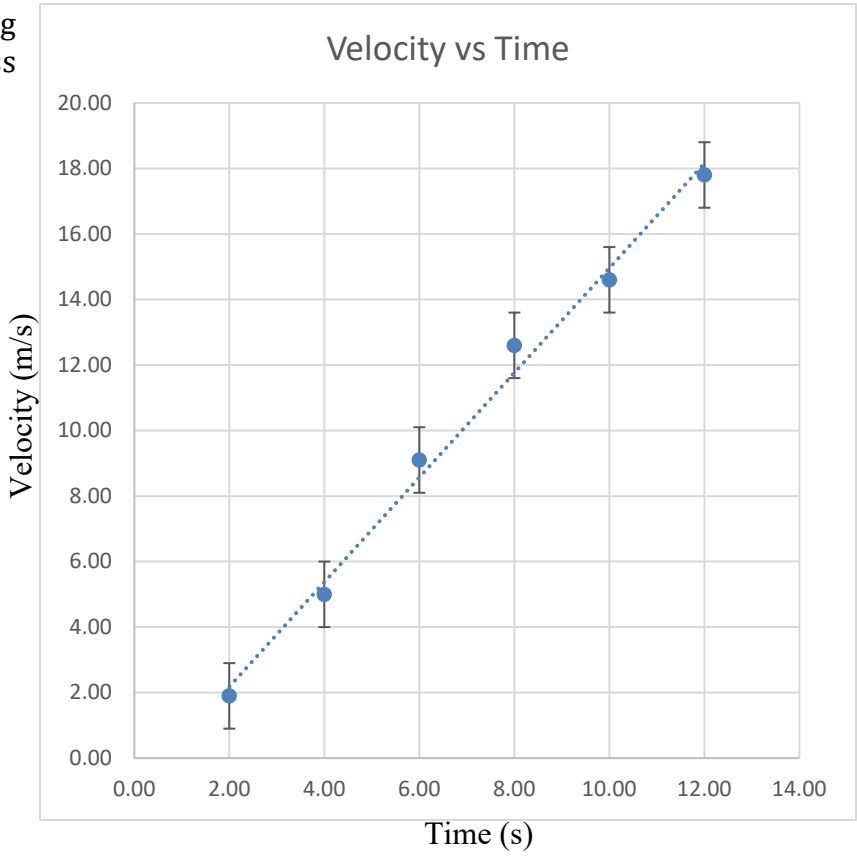
Draw a tangent line at m = 0.2kg.



Current (A)	Voltage (V)
1.15	4.75
2.09	8.65
3.17	15.05
4.02	19.50
5.25	26.95
6.04	29.80



An AP Physics student created the following graph of a boat's velocity as it pulls a skier across a lake.



What is the independent variable?

What axis is it graphed on?

What is the dependent variable?

What axis is it graphed on?

Calculate the slope:

What was the boat's starting velocity?

How long did the boat pull the skier?

The student's lab partner is trying to create an equation to model the boat's velocity for the trip. She proposes the following equation: $v = v_{max} - \frac{A}{t}$ where v_{max} is the boat's maximum velocity, t is the elapsed time and A is some positive integer (with appropriate units). Does this equation match the data collected? Explain.