AP PHYSICS 1 Summer Assignment 19-20 Name: _____

*All parts of this AP Physics 1 Summer Assignment are to be done individually.
*Contact Mr. Babich at ababich@mchs.net or Mr. Maloney at rmaloney@mchs.net with questions.
*If you lose this packet, go to the school website > students and parents > Honors/AP for a replacement

***Part I*:** Motion Graphs Packet - Guided Reading

Go to http://ababich.edublogs.org and find AP Physics 1 Summer Assignment for School Year 19-20. Click on the Motion Graphs Packet pdf to answer the questions below. Page numbers are given as a reference.

1. How are the axes labeled on a distance-time graph? (pg 1)

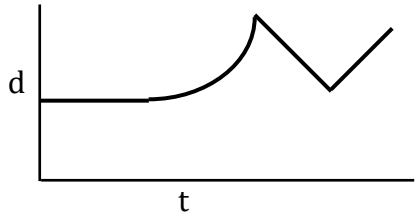
2. What does a horizontal line on a distance-time graph indicate? (pg 1)

3. How can you tell if an object is moving at a constant speed? (pg 2)

4. On the 2nd graph on page 2:
   a. Which line shows a higher speed, dotted or solid?
   b. Are both lines showing constant speeds?

5. A curved line on a distance-time graph indicates what? (pg 2)

6. Use the info given in the graph on pg 3 to describe (label) the 4 parts of this graph:



7. Use the graphs on pg 4 to determine which one shows that one runner started 10 yards further ahead of the other. Explain your answer.

8. Use the graphs on pg 5 to determine which one shows both runners moving at the same speed? Explain your answer.

9. Match the descriptions to the distance–time graphs given on pg 6. **Explain your answers.**
   a. Graph A matches description _____ because _____.
   b. Graph B matches description _____ because _____.
   c. Graph C matches description _____ because _____.
   d. Graph D matches description _____ because _____.

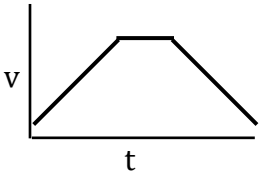
10. Does a straight line on a speed-time graph correspond to a stationary object? Why or why not? (pg 7)

11. How can you show with a speed-time graph:
    a. An object that is speeding up?

    b. An object that is slowing down?

12. Why does the dashed line have a greater acceleration? (pg 8)

13. Use the information on the graph (pg 8) to describe the following speed-time graph:



14. Match the descriptions to the speed–time graphs given on pg 9. **Explain your answers.**
    a. Graph E matches description _____ because _____.

    b. Graph F matches description _____ because _____.

    c. Graph G matches description _____ because _____.

    d. Graph H matches description _____ because _____.

For questions 15-19, look at the graph on pg 10 of three people running a 100-meter race.

15. Which runner won the race? Explain your answer.

16. Which runner stopped for a rest? Explain your answer.

17. How long was the stop? Explain your answer.

18. How long did Bob take to complete the race? Explain your answer.

19. Calculate Albert's average speed. (Figure the distance and the time first!)

For questions 20-24, look at the graph on pg 11 of a bus changing speeds during a trip.
Choose the correct words from the list on pg 11 to describe the motion during each segment.

20. **Segment 0-A** The bus is _____. Its speed changes from 0 to 10 m/s in 5 seconds.

21. **Segment A-B** The bus is moving at a _____of 10 m/s for 5 seconds.

22. **Segment B-C** The bus is _____. It is slowing down from 10 m/s to rest in 3 seconds.

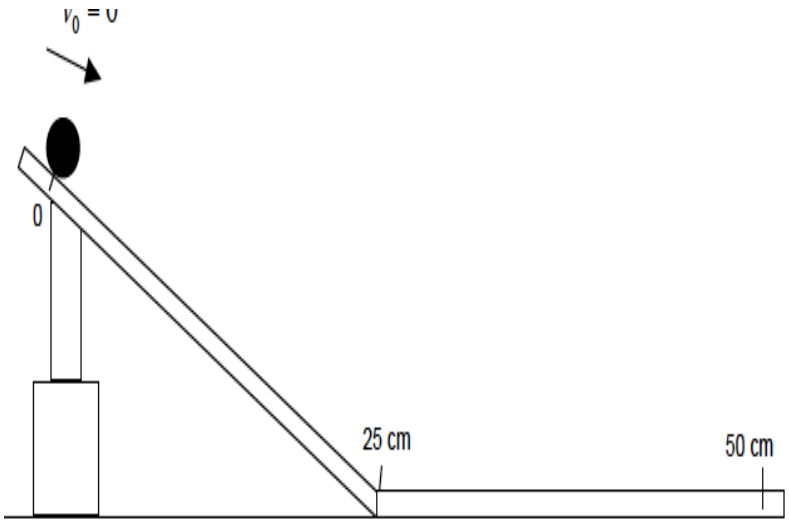
23. **Segment C-D** The bus is _____. It has stopped.

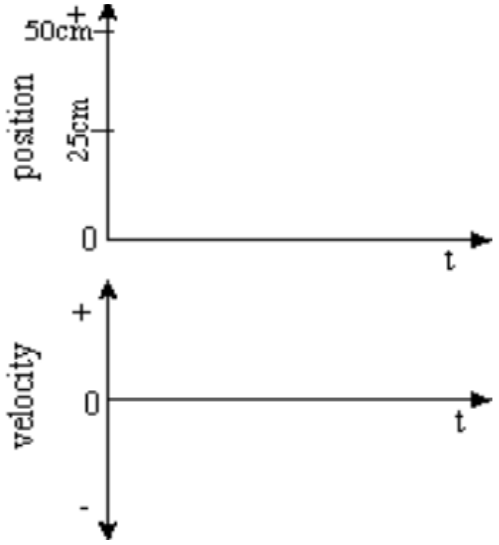
24. **Segment D-E** The bus is _____. It is gradually increasing in speed.

Part II: Motion Maps

Go to http://ababich.edublogs.org and find AP Physics 1 Summer Assignment for School Year 19-20. Click on "Reading Motion Maps, AP Physics 1" to open the PDF that will help you answer the questions.

1. Consider the diagram below. Assume the ball is released from rest ($v_0 = 0$) and rolls down the incline. Also, assume that the ball experiences no change in velocity while rolling along the horizontal part of the ramp (25-50 cm).
    a. Draw a motion map of the movement of the ball on the diagram below, using a total of 6 arrows.
    b. Complete the position vs. time and velocity vs. time graphs on the blank graphs provided below
    c. Write a description of the motion of the ball from the 0 cm mark to the 50 cm mark.





Description of Motion:

Part III: Getting to know the AP Physics 1 Exam

Go to: the AP Physics 1 student site: https://apstudent.collegeboard.org/apcourse/ap-physics-1. Scroll down until you see the links to PDFs. Open the PDF "AP Physics 1 Course Exam and Description". It is a 130-page document. Download this file for quick reference. Each bullet point below requires a written response.

- Pg 6-10: Description of Course and the Course Objectives
    - List each "Big Idea" that will be covered in AP Physics 1
    - Explain why it makes sense that each "Big Idea" is not its own unit, but instead can be included in multiple units of content.
- Pg 11-15: 7 Scientific Practices
    - Summarize each scientific practice in 1-2 sentences.
    - Briefly describe an experiment you performed in chemistry or biology that included at least 3 of the Scientific Practices. Explain how those scientific practices were involved in the experiment.
- Pg 68-72: Exam Format
    - Pay special attention to the meaning of specific words in "Terms Defined". Which of the words do you think are the hardest to interpret and/or differentiate between and why?
    - In the "Paragraph-Length Response" section, read paragraphs 4 and 6 carefully. Explain why it is important that you first plan out your "Paragraph-Length Response" before you begin writing and then that you read over your paragraph when you have completed it.
- Pg 122-123: Advanced Placement Physics 1 Table of Info & Advanced Placement Physics 1 Equations
    - Print out both tables. You will need to bring these to class to use when working on problems.
    - List 1-2 equations from the mechanics/electricity/waves sections on pg 123 that are somewhat familiar and discuss your experience with the equation(s).
    - List 1-2 equations from the mechanics/electricity/waves sections on pg 123 that look interesting or that you would like to know more about and why.

Part IV: Using Online Resources for AP Physics 1

There are many websites that can be helpful when learning, studying and reviewing AP Physics 1 concepts. Look for a source you think might be helpful and complete the 3 steps below. I will share all of the resources found in each class.

1. Find 1 online resource. List the website for the resource: _____
2. Evaluate its potential helpfulness on the criteria listed:
    a. Timeliness: How current is the material? When was it updated? Do links on the site work?
    b. Relevance:Is the website specifically for AP Physics 1? Is the material challenging/AP level?
    c. Authority: Who is the author or creator (company)? Are they qualified?
    d. Accuracy: Are there glaring errors? Are there reviews of the site?
    e. Purpose: Do you feel this source is best used as an introduction to a unit, (during the first few days) at the end of a unit, (for review) or throughout a unit?
3. Give a brief summary of the resource and an overall rating: from 1-5, with 5 being the best

Below are a few online resources I have found and evaluated:

1. The Physics Classroom: http://www.physicsclassroom.com/
    a. Timeliness: Much of the 'tutorial' material was originally created about 20 years ago. However, new 'Interactives' continue to be added that help you visualize a concept.
    b. Relevance: The site covers most of the AP Physics 1 concepts, but it is not specifically geared toward AP Physics 1. Most of the problems are good for initial practice, but do not have the same format or difficulty as questions on the AP test.
    c. Authority: The creators of the site are Illinois high school physics teachers who have had many years experience teaching physics.
    d. Accuracy: There are a few instances where I use slightly different terminology, but the answers provided with the questions are
    e. Purpose: This source is best used as a pre-lecture source (for background information) or to reinforce topics covered in class. It is similar to a textbook in its presentation. The problems give immediate feedback and, in most cases, the work leading up to the solution. Helpful, but not the best source for reviewing before an assessment.
    f. Summary and Rating: Good information in the 'tutorials' and practice problems for initial learning, but not AP difficulty. Some 'Interactives' to help illustrate concepts. **3 out of 5**

2. Flipping Physics: https://www.flippingphysics.com/
    a. Timeliness: Many of these videos were created in the last few years, after the AP Physics 1 course was developed, so the videos match the content of the exam.
    b. Relevance: The site hosts many videos, each about 10 min in length and broken down by topic. While these videos were not made with only AP Physics 1 in mind, they are mostly geared toward the AP test topics. Also, look for the button or link to the lecture notes for the video (or whole unit).
    c. Authority: The creator if the site has been a high school AP Physics teacher for a number of years.
    d. Accuracy: If you watch theses videos on YouTube, the creator does a good job of addressing comments. Corrections are usually done by a pop-up in the video.
    e. Purpose: To provide physics information in short increments in an entertaining way. Best used after class as a reinforcement of the lesson. Good lecture notes that include equations, but sometimes has more information or equations than necessary.
    f. Summary and Rating: The videos provide good lectures on the concepts, but not much in terms of practice problems. The videos are fun to watch, but you may need to pause or go back and re-watch some sections. Bring a notebook to take notes and/or download the lecture notes he has available. **4 out of 5**