Name _____ Hour _____

Optional Review for the Physics Q1 Final

THE PHYSICS Q1 Final (We do this every quarter, so don't throw anything away!)
2-part final on everything from quarter 1- _____points total

Part 1-Short answer/problems on_____, _____ points total
The problems will be:
3 1-D motion problems
1 vector solved EITHER graphically or by components
1 projectile shot horizontally
1 projectile shot at an angle
1 short answer

Part 2- Multiple choice on _____ , _____ points

***This review MAY not cover everything! Make sure to study all your handouts!**

Organize all of your papers- This will help you later in the year!

****FIND THESE HANDOUTS, PUT THEM IN THIS ORDER, PAPERCLIP THEM TOGETHER, AND STORE THEM SOMEWHERE SAFE!**

QUARTER 1

INTRODUCTION:
Conversion WS
Cars Lab
Math and Conversion Review

MOTION IN ONE DIMENSION:
Motion Graphing Lab
Notes for 1-D problems
Level 1: One-Dimensional Motion Problems
Level 2: One-Dimensional Motion Problems
Fun with One-Dimensional Motion Equations Lab
Variable Quiz
1-D Motion Quiz
Review for One-Dimensional Motion Test

VECTORS:
Notes and Problems for Vectors

PROJECTILE MOTION:
Projectiles Shot Horizontally- notes and problems
The Marble Lab
Angled Projectile notes
Angled Projectiles Level 1
Angled Projectiles Level 2
Tennis Ball Lab
Fun with 2-D Motion Lab
Projectile Motion Review-

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Multiple Choice Review:

1. What does it mean exactly when we say that a falling object accelerates at a rate of -9.8 m/s^2?

2. What is acceleration and when do we use -9.8 m/s^2?

3. What is a scalar? Give two examples.

4. What is a vector? Give two examples.

5. What is the sum of two or more vectors called? _____

6. What quantity does the slope of a distance vs. time graph give you? _____

7. What quantity does the slope of a velocity vs. time graph give you? _____

8. What does a horizontal line on a distance vs. time graph mean? _____

9. What does a horizontal line on a velocity vs. time graph mean? _____

10. What does the area under a velocity vs. time graph give you? _____
11. What is a projectile? Give two examples.

12. At what point during a projectile's flight is it at maximum height? What Δt should you use?

13. What are the units/variables for horizontal velocity? Vertical velocity? Height?

14. What happens to the velocity of a projectile in the x direction throughout its flight?

15. What happens to the velocity of a projectile in the y direction throughout its flight?

16. When do we use the whole time and when do you use the time at the top when solving projectile problems that start and land at the same height?

17. When we shoot a projectile horizontally, explain what shape its path makes. Include a sketch and what V_{iy} is.

18. If you shoot a bullet and drop a bullet at the same time from the same height in a vacuum (or no air resistance), explain why they hit at the same time. Include a sketch.

19. Explain how the velocity of an object is related to its v_x and v_{iy}. Include the mathematical relationship among them.

20. Explain what happens when you change the angle of a projectile from 45˚ N of E to 70˚.

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Short Answer Review:

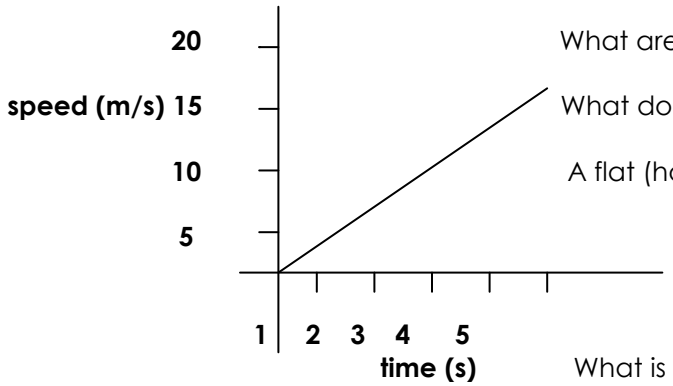
Introductory Material:

1. Convert the speed of light (3.00×10^8 m/s) into km/hr. (1.08×10^9 km/hr)

2. What units do you end up with if you multiply acceleration by time.

1- Dimensional Motion:

3. Use the graph of a car's motion below to answer the following questions:



What are the units of the slope? _____

What does the slope measure? _____

A flat (horizontal line) on graph means what? _____

If you multiply speed x time, what unit do you end up with? _____

What is the car doing? _____

How far (Δx) did the car travel in the 5 seconds? Solve this using both:
area under the line (triangle) **AND** a **1-D equation**

4. Nathan accelerates from rest to 12.5 m/s in 2.5 sec.
   a. What is his acceleration? (5 m/s^2)

   b. How far did he travel? (15.6 m)

5. A bus slows down from 75 km/hr to a stop in 21 sec. How far did it travel? CAREFUL with both units and acceleration! *(219 m)*

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6. A worker drops a wrench from the top of a tower 80.0 m tall. What is the velocity right before the wrench hits the ground? *(-39.6 m/s)*

7. A cannon ball starts at rest and leaves the cannon at a speed of 12 m/s. The length of the cannon is 1.4 m. How long (Δt) was the cannon ball in the cannon? *(ans. 0.23 sec.)*

Projectile Motion:

8. A rescue plane drops a package to a stranded party of explorers. The plane is traveling horizontally at 100 m/s at a height of 50 m above the ground. What horizontal distance (Δx) does the package travel before striking the ground? *(ans. 319 m)*

9. A baseball is thrown at an angle of 25° N of E with a velocity of 23 m/s. If the ball travels 42 m horizontally,
    a. How long (Δt) was it in the air, and what was the maximun height of the ball? (2.0 sec, 4.8 m)

10. You launch a tennis ball and it travels 19 m in 1.2 seconds. Calculate the velocity of the ball and the angle it was launched at. (16.9 m/s at 20.3° N of E)

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Vectors:

11. You travel 30 km at 25° E of S and then 25 km at 30° N of E. Find your displacement
(37.3 km at 23.1° S of E)

Solve this problem graphically: (Use a scale of 1 cm = 5 km.)

By resolution into components:

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12. An airplane travels straight east (along east axis) at 120 m/s. The wind blows with a velocity of 160 m/s at 25° W of S. What is the resultant velocity of the plane? (Use a scale of **1 cm = 20 m/s**) *(154 m/s at 19.8°E of S)*

Solve this problem graphically:

By resolution into components: