**Unit 2 Vectors and 2D Motion Study Guide**

**Vocabulary to know**

Vector

Scalar

Magnitude

Direction

Angle

Radian

Components

Trajectory

Range

Horizontal launch

Projectile

**Skills**

Distinguish between vectors and scalars

Identify identical, multiple and opposite vectors

Add vectors graphically using either the triangle rule or the parallelogram rule

Add vectors analytically

Solve general 2D motion problems

Solve horizontal launch projectile motion

Solve general projectile motion problems launched at an angle

Solve range problems

**Memory items**

Formulas for converting vector magnitude/direction and components.

Special features of projectile motion

**Unit 1 Test Description:**

|  |  |
| --- | --- |
| 12 x 2 pts Multiple choice | |
| 10 x 2pts | True false about projectile motion |
| 1 x 6 pts | Add vectors graphically |
| 1 x 6 pts | Add vectors analytically |
| 1 x 8 pts | Vector algebra |
| 1 x 12 pts | Horizontal launch problem |
| 1 x 10 pts | Range problem |
| 1 x 14 pts | General projectile motion problem |

You will not be allowed to sit next to someone during the test. Two will sit on opposite sides, but not across, and one will sit at an end, ala ACT testing positions. Each student will have a testing folder trifold to create privacy and block views from others at the same table. You will be allowed to use your calculator and a blank testing version of the IB data packet. BEWARE: YOU WILL NOT BE ALLOWED TO USE YOUR PHONE AS A CALCULATOR AND THERE ARE LIMITED CALCULATORS AVAILABLE TO BORROW. **BRING YOUR OWN CALCULATOR.** You will be asked to place your phone in your backpack at your feet or in a box on the front bench. There shall be nothing on the tables or chairs beside the test, your calculator, the data packet and a writing implement.

**IB Stated Objectives**

**1.3 Vectors and Scalars**

* **Vector and scalar quantities**
* **Combination and resolution of vectors**

1. Distinguish between vector and scalar quantities.
2. Resolve a vector into its components.
3. Reconstruct a vector from its components.
4. Carry out operations with vectors.
   1. Adding graphically (2 ways) and analytically
   2. Scalar multiplication

**2.1 Motion**

* **Distance and displacement**
* **Speed and velocity**
* **Acceleration**
* **Graphs describing motion**
* **Equations of motion for uniform acceleration**
* **Projectile motion**

1. Understand the difference between position, distance and displacement.
2. Understand the difference between speed and velocity.
   1. Distinguish between constant, average and instantaneous velocity.
3. Understand the concept of acceleration.
   1. Distinguish between constant, average and instantaneous acceleration.
4. Analyze graphs describing motion
   1. Describe displacement, velocity and acceleration variables using x vs t, or v vs t graphs.
   2. Draw an x vs t or a v vs t graph to describe motion.
5. Solve motion problems involving constant acceleration problems including freefall.
   1. Solve problems involving constant velocity motion.
6. Solve projectile motion problems.

**IB Textbook Review Exercises (all answers in back of textbook)**

1.3:p30 #35-46 – Vector problems

2.1 p56 #25-30 – Projectile motion problems

**Other Review Resources**

Class powerpoints (posted online)

1.3 and 2.1 Homework worksheets

Personal Class notes

Review worksheet