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| **Year 10 Physics Semester 2 2022 Test 1: Vectors and Motion**  *Place school logo here*  **Name:** Student 1  **Class:** 10SPH02 | | | | | **Achievement** | | | |
| **Revision needed** | **Good: revision advised** | **Very Good: revision advised** | **Excellent** |
| **Ch** | **Description** | **Qns** | **Marks awarded** | **Marks available** |
| 8.2 | Adding vectors in one and two dimensions | 8,10 | 2 | 2 |  |  |  | • |
| 8.3 | Subtracting vectors in 1 and 2 dimensions | 9 | 1 | 1 |  |  |  | • |
| 8.4 | Vector components | 12,14 | 5 | 5 |  |  |  | • |
| 9.1 | Displacement, speed and velocity | 1,4,15ab | 4 | 4 |  |  |  | • |
| 9.2 | Acceleration | 5,11 | 2 | 2 |  |  |  | • |
| 9.3 | Graphing position, velocity & accn over time | 7,13 | 6 | 7 |  |  | • |  |
| 9.4 | Equations for uniform acceleration | 15cd | 0 | 3 | • |  |  |  |
| 9.5 | Vertical motion | 2,3,6 | 3 | 3 |  |  |  | • |
|  |  |  | 0 |  | • |  |  |  |
|  |  |  | 0 |  | • |  |  |  |
|  |  |  | 0 |  | • |  |  |  |
| Deduction for incorrect significant figures | | |  |  |  |  |  |  |
| Deduction for incorrect direction | | | -1 |  |  |  |  |  |
| Deduction for incorrect units | | | 0 |  |  |  |  |  |
| **Total marks awarded (out of 27)** | | | 22 |  |  |  |  |  |
| **Scaled grade** | | | A |  |  |  |  |  |

**Feedback:**

Well done Student 1. You have demonstrated a very good understanding of the content covered in the vectors and motion topics.

* As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
* As in Q2, you are analysing vertical motion problems effectively.
* As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
* As in Q4, you are correctly identifying that constant velocity means a = 0 and you are converting between units effectively to solve motion problems.
* As in Q5, you are correctly finding acceleration as the change in velocity (i.e. Δv = v - u) divided by the time interval.
* As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of g = 9.8 m/s^2 near Earth's surface if air resistance is ignored.
* As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.
* As in Q8, you are using the head-to-tail method correcly to add vectors in 2 dimensions.
* As in Q9, you are using the head-to-tail method correcly to subtract vectors in 2 dimensions by adding the negative of the second vector.
* As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.
* As in Q11, you are finding the change in velocity effectively using Δv = v - u while considering the associated vector directions thoroughly.
* As in Q12, you are correctly identifying that the component of the weight force, mg, which acts parallel to the surface for an object moving down an inclined plane is equal to mgsinθ, where θ is the angle of the incline above the horizontal.
* As in Q13a, remember that acceleration is given by the gradient of a velocity-time graph or simply a = Δv/t = (v - u)/t. Remember to read axis values and units carefully and to include directions with all vector quantities.
* As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.
* As in Q13b, remember that displacement is given by the area under of a velocity-time graph. Remember to show full working and to read axis values and units carefully.
* As in Q13b, you are correctly finding displacement as the area under of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.
* As in Q13c, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.
* As in Q13c, you are answering explaining questions clearly and specifically by referring to the wording in the question.
* As in in Q14, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.
* As in Q15a-b, you are converting between km/h and m/s correctly and analysing motion problems effectively.
* As in Q15c-d, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will deccelerate while braking. Remember to use exact values (or at least 4 decimal places) in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.

I encourage you to revise any areas suggested above in order to lay a solid foundation for Units 3/4 Physics and to challenge yourself with extension problems while seeking help when required.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

{ *insert signature here* }   
(Mr/Ms/Mrs) Teacher Name

Re-do question/s: 15cd