**Noteguide for Kinematics - Videos 2D Name**

**2D - Kinematics** (We call these suvat problems - you'll figure out why ; - )

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| v = u + at (memorize)  s = (u + v)t  2  v2 = u2 + 2as  s = ut + ½at2 | s - displacement (m)  u - initial velocity (m/s)  v - final velocity (m/s)  a - acceleration (m/s/s)  t - time (s) |

(write down the names I give them, like "No s", "No a" etc.)

Example 1: A car goes from 14 m/s to 26 m/s in 300. m.

* What is the acceleration, and
* What time does it take?

Example 2: A rocket going 3130 m/s accelerates at 0.00135 m/s/s for a distance of 5.50 x 109 m.

* What time does it take, and
* What is the final velocity?

Try these example problems.

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| 1. A cart stops in a distance of 3.81 m in a time of 4.51 s. What was its initial velocity? (1.69 m/s) | 2. A car going 12 m/s accelerates at 1.2 m/s/s for 5.0 seconds. What is its displacement during this time? (75 m) |
| 3. Another car with a velocity of 27 m/s stops in a distance of 36.74 m. What was its acceleration?  (-9.9 m/s/s) | 4. A car’s brakes slow it at 9.5 m/s/s. If it stops in 47.3 m, how fast was it going to start with? (30. m/s) |
| 5. What time will it take a car going 23 m/s to start with, and accelerating at 3.5 m/s/s, to go 450 m?  (10.7585 ≈ 11 s Hint - it is quadratic with "No v" but you can use "No t" to find v, and then use "No s" to find t without using the quadratic equation) | |