Name _____Answer Key_____ Date _____

Honors Physics Kinematics WS #6H

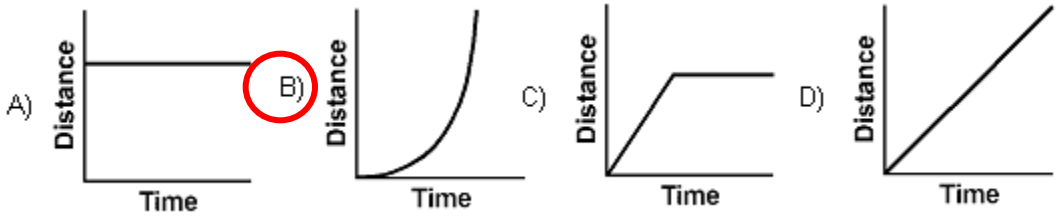
Period _____ Mrs. Nadworny

A

Kinematics

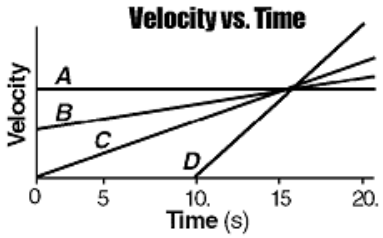
Directions: Read textbook pages 48 – 58. Solve the following problems using the GUESS method. Show all work clearly.

1. Which graph best represents the motion of a block accelerating uniformly down an inclined plane?



Use the information below to answer questions 2 – 3.

The diagram below represents the relationship between velocity and time of travel for four cars, A, B, C, and D, in straight- line motion.



2. Which car travels the greatest distance during the time interval 0 – 20. s?

A) A B) B C) C D) D

3. Which car has the greatest acceleration during the time interval 10. to 15 seconds?

A) A B) B C) C D) D

4. An observer recorded the following data for the motion of a car undergoing constant acceleration.

Time (s)	**Speed** (m/s)
3.0	4.0
5.0	7.0
6.0	8.5

What was the magnitude of the acceleration of the car?

A) 1.3 m/s^2 B) 1.5 m/s^2 C) 2.0 m/s^2 D) 4.5 m/s^2

Continued on next page

5. Mrs. Nadworny is out driving in her Ford Edge at 9.8 m/s. She accelerated at a rate of 1.6 m/s^2 for 20. seconds. How far down the road is she?

$$d = v_i t + \frac{1}{2}at^2$$

$$d = (9.8\,\tfrac{m}{s})(20.s) + \frac{1}{2}(1.6\,\tfrac{m}{s^2})(20.s)^2$$

$$d = 520\ m$$

6. Mark Meiwurdz is buzzing around town on his skateboard at 6.1 m/s when he runs into some dirt that slows him down at a rate of - 0.79 m/s^2. How long will it take him to come to a complete stop?

$$t = \frac{v_f - v_i}{a} = \frac{0\ \tfrac{m}{s} - 6.1\ \tfrac{m}{s}}{-0.79\ \tfrac{m}{s^2}} = 7.7\ s$$

7. If Dusty Rhodes' Corvette can go from zero to 24 m/s in 2.15 seconds, what is its rate of acceleration?

$$a = \frac{v_f - v_i}{t} = \frac{24\,\tfrac{m}{s} - 0\,\tfrac{m}{s}}{2.15\ s} = {}^{+}11\ \tfrac{m}{s^2}$$

8. An airplane accelerates at 7.84 m/s^2 for 150. seconds to reach a velocity of 1900. m/s north. What was its initial velocity?

$$v_i = v_f - at = (1900.\,\tfrac{m}{s}) - (7.84\,\tfrac{m}{s^2})(150.s) = 724\ \tfrac{m}{s}\ \text{north}$$

9. Carrie N Books is running around the track. She makes a sprint for the finish line, which is 1100. meters west of her current position. If her rate of acceleration is 1.60 m/s^2 and she continues for 31.0 seconds, what was her initial velocity?

$$v_i = \frac{d - \frac{1}{2}at^2}{t} = \frac{1100.m - \frac{1}{2}(1.60\,\tfrac{m}{s^2})(31.0s)^2}{31.0s} = 10.7\ \tfrac{m}{s}\ \text{west}$$

Answers in size order: 7.7, 10.7, 11, 520, 724