Worksheet based on problems authored by R. Morse at St. Albans School and Worksheets by Randall D. Knight

Name_____Sec_____Date_____

CONSTANT ACCELERATION PROBLEM WORKSHEET

1. A Boeing 747 jumbo jet with 400 passengers requires a takeoff speed of about 350 km/h with a take-off length of 3.32 km. If the plane accelerates constantly starting from rest, what is the necessary acceleration?

Mass of the jet = 812,300 lbs

Part 1: Motion Diagram	Part 1: Sketched Graph for Velocity vs. Time
Part 2: Table and Unit Conversions Known: To find:	Part 2: Equations _____ Part 3: Algebra and Substitution **ANSWER** (with proper sig. fig.)
Part 4: Units Check	Reasonable?
Part 5: Description of the Net Force Causing the Acceleration and its Calculation based on a knowledge of the Acceleration	

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CONSTANT ACCELERATION PROBLEM WORKSHEET

4. On a dry road a Lincoln Mark VIII automobile (*Car & Driver*, Feb 1993, p 80) was able to brake with a deceleration of 8.6 m/s/s. How much time does the Lincoln take to stop if it is travelling initially at 24.6 m/s?

Mass of the Lincoln = 1697 kg

Part 1: Motion Diagram	Part 1: Sketched Graph for Velocity vs. Time
Part 2: Table and Unit Conversions Known: To find:	Part 2: Equations _____ Part 3: Algebra and Substitution **ANSWER** (with proper sig. fig.)
Part 4: Units Check	Reasonable?
Part 5: Description of the Net Force Causing the Acceleration and its Calculation based on a knowledge of the Acceleration	

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CONSTANT ACCELERATION PROBLEM WORKSHEET

7. In a record run, a drag racer accelerated from 0 to 475 km/h in 4.88 s (Guiness Book of Records, 1992). Assuming a constant acceleration, how far did it travel during this time?

Mass of the drag racer = 885 kg

Part 1: Motion Diagram	Part 1: Sketched Graph for Velocity vs. Time
Part 2: Table and Unit Conversions Known: To find:	Part 2: Equations _____ Part 3: Algebra and Substitution **ANSWER** (with proper sig. fig.)
Part 4: Units Check	Reasonable?
Part 5: Description of the Net Force Causing the Acceleration and its Calculation based on a knowledge of the Acceleration	

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CONSTANT ACCELERATION PROBLEM WORKSHEET

10. A skydiver is falling through the air at a speed of 200 km/h when he opens his parachute, which then gives him a constant deceleration of 8 km/h/s. How far does he fall in the next two seconds?

Mass of the skydiver with equipment = 114 Kg

<table>
<tr><td>Part 1: Motion Diagram</td><td>Part 1: Sketched Graph for Velocity vs. Time</td></tr>
<tr><td>Part 2: Table and Unit Conversions
Known:

To find:</td><td>Part 2: Equations

_____
Part 3: Algebra and Substitution

ANSWER
(with proper sig. fig.)</td></tr>
<tr><td colspan="2">Part 4: Units Check Reasonable?</td></tr>
<tr><td colspan="2">Part 5: Description of the Net Force Causing the Acceleration and its Calculation based on a knowledge of the Acceleration</td></tr>
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Name_____Sec_____Date_____

CONSTANT ACCELERATION PROBLEM WORKSHEET

11. You are driving down a straight highway at 20 m/s (72 km/h) on a foggy night. Suddenly you see a truck stopped directly in front of you a distance 52 m down the roadway. Assume that your reaction time is 1.0 s and that when you step on the brake you can achieve a maximum deceleration of 4 m/s^2. What will your speed be when you collide?

The car has a mass of 1400 kg.

Part 1: Motion Diagram	Part 1: Sketched Graph for Velocity vs. Time
Part 2: Table and Unit Conversions Known: To find:	Part 2: Equations _____ Part 3: Algebra and Substitution **ANSWER** (with proper sig. fig.)
Part 4: Units Check	Reasonable?
Part 5: Description of the Net Force Causing the Acceleration and its Calculation based on a knowledge of the Acceleration	