

Name: \_\_\_\_\_

Date: \_\_\_\_\_

MCHS Honors Physics 2014-2015

## Kinematics 2

Each problem is worth 10 points, according to the 5 Steps to solving a physics problem:

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| 1) Draw a picture  | 2 points |
| 2) Make a list of what you know (label the picture if possible)    | 3 points |
| 3) Make a list of what you don't know and what you are looking for | 2 points |
| 4) List any equations you may need to find what you're missing     | 2 points |
| 5) Solve the problem   | 1 point  |

1) While standing on top of a bridge over Royal Gorge in Colorado, you wish to determine the height of the bridge over the water. You drop a rock off the bridge and determine that it hits the water 9.00 seconds later. What is the height of the bridge?

2) How fast is the rock from problem 1 traveling when it hits the water?

3) An annoying cat is launched straight up into the air with a velocity of 25 m/s at time  $t=0$  sec. Find the velocity of the cat and its height above the ground at times  $t=1$  sec,  $t=2$  sec, and  $t=3$  sec.

4) If we launch the same cat from problem 3 into the air with a velocity of 50 m/s. What is its maximum height above the ground?

5) A student, looking out an open window, sees a zombie standing 75 meters below her on the sidewalk. She decides to drop a 15 kg flowerpot onto the zombie's head, hopefully killing the undead freak. If the flowerpot has to be travelling at 40 m/s to crush the zombie's head, will the flowerpot do the job?

8) A car is able to accelerate at  $14 \text{ m/s}^2$ . If the car is initially traveling at 10 km/hr, how long does it take to reach a speed of 120 km/hr?