1-D motion remediation worksheet

1. A velocity-time graph for a school bus is shown to the right. Describe the motion of the school bus using the information in the graph

**Moves right at constant vel 2.0 m/s then accelerates at 2.0 m/s/s for 4 seconds**

1. A ball is thrown upward at 30m/s. Fill in the table below to indicate its displacement, velocity, and acceleration at each second that it is in the air.

|  |  |  |  |
| --- | --- | --- | --- |
| Time | Acceleration | Velocity | Displacement |
| 0s | **– 10 m/s/s** | 30 | 0 |
| 1s | **– 10 m/s/s** | 20 | 25 |
| 2s | **– 10 m/s/s** | 10 | 40 |
| 3s | **– 10 m/s/s** | 0 | 45 |
| 4s | **– 10 m/s/s** | – 10 | -5 |
| 5s | **– 10 m/s/s** | – 20 | -25 |
| 6s | **– 10 m/s/s** | – 30 | -45 |
| 7s |  |  |  |

1. A train is slowing down while moving towards the East. Label each of the following as being directed towards the East, West, or being zero
   1. Velocity

**East**

* 1. Acceleration

**West Opposite velcoity**

1. A ball is thrown directly upward (consider up to be the positive direction). Label each of the following as being positive, negative or zero.
   1. The ball’s velocity on the way up **Pos**
   2. The ball’s velocity on the way down **Neg**
   3. The ball’s velocity at it’s highest point **Zero**
   4. The ball’s acceleration on its way up **Neg**
   5. The ball’s acceleration on its way down **Neg**
   6. The ball’s acceleration at its highest point **Neg**
2. Explain why the slope of a position-time graph shows velocity. **Slope would be Δx/t which is definition of velocity**
3. Explain why the slope of a velocity-time graph shows acceleration. **Slope would be Δv/t which is definition of acceleration**
4. A ball is rolled up and down a ramp. Describe what happens to each of the following measurements at each of the indicated points in time

|  |  |  |  |
| --- | --- | --- | --- |
|  | Velocity | Acceleration | Displacement |
| On the way up | Decreases | Constant and negative | Decreases each second |
| At its highest point | Zero | Constatn and negative | At max |
| On its way down | Increases magnitude  Negative direcction | Constant and negative | Increases each second |

1. A student is running across a soccer field. He then slides on his knees until coming to a stop. Explain this situation using the terms “velocity” and “acceleration” correctly.

**Student has positive velocity and the slide give negative acceleration to slow them down.**

1. An irate band director standing on a 12m high platform drops a mellophone and a marble at the same time.
   1. Explain which one will land first and why. **Land same time. accelerated the same by gravity.**
   2. Calculate the time it takes for the mellophone to reach the ground.

12 = ½ (9.8)(t2) t = 1.56 s

1. A marble is placed on a ramp. It accelerates at a rate of 0.5m/s/s as it rolls down the 2m long ramp. How long will it take for the marble to reach the bottom of the ramp?

X = ½ at2 2 = ½ (0.5)(t2) t = 2.82 s