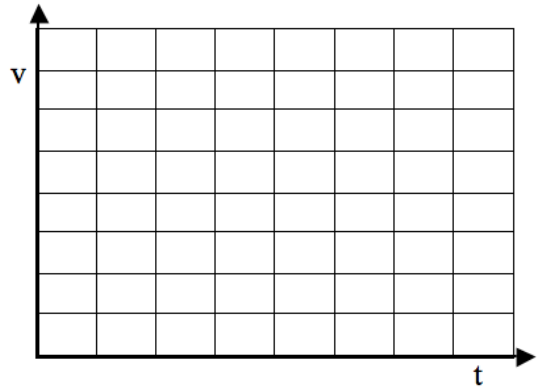
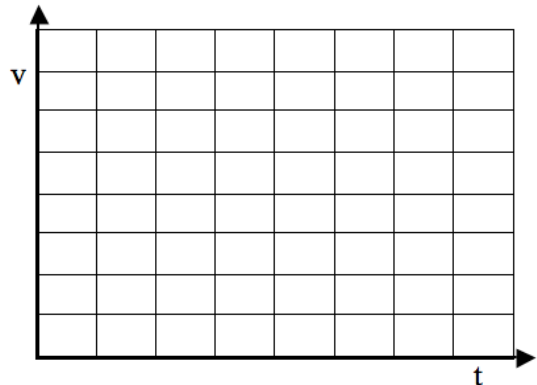


## Uniformly Accelerated Particle Model Worksheet 5: Quantitative Acceleration Problems

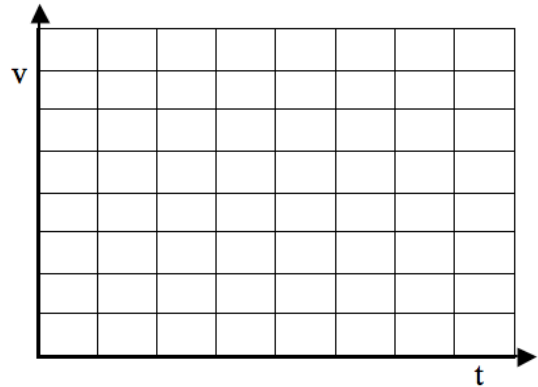
1. A poorly tuned car accelerates from rest to a speed of 28 m/s in 20 s.
  - a. Make a well-labeled diagram of the situation.
  - b. Make a well-labeled graphical representation of the situation.
  - c. List given quantities and quantities to find as you determine:
    - i. What is the average acceleration of the car?
    - ii. How far does it travel in this time?



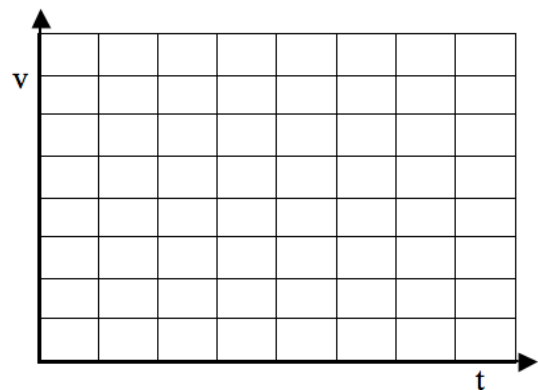
2. At  $t = 0$  s a car has a speed of 30 m/s. After 6 s, its speed is 15 m/s.
  - a. Make a well-labeled diagram of the situation.
  - b. Make a well-labeled graphical representation of the situation.
  - c. List given quantities and quantities to find as you determine the car's average acceleration during this time interval.



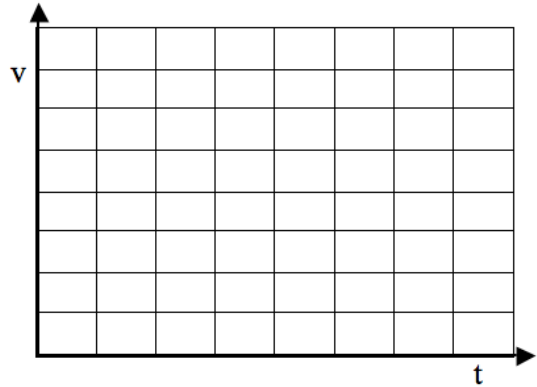
3. A student drops a rock from the top of a 30 meter tall building.
  - a. Make a well-labeled diagram of the situation.
  - b. Make a well-labeled graphical representation of the situation.
  - c. List given quantities and quantities to find as you determine how fast the student will be traveling just before impact.



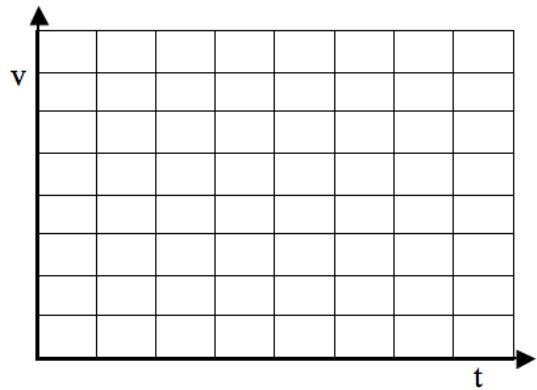
4. A bus initially moving at 20 m/s slows by 4 m/s each second.
  - a. Make a well-labeled diagram of the situation.
  - b. Make a well-labeled graphical representation of the situation.
  - c. List given quantities and quantities to find as you determine:
    - i. How much time does it take the bus to stop?
    - ii. How far does it travel while braking?



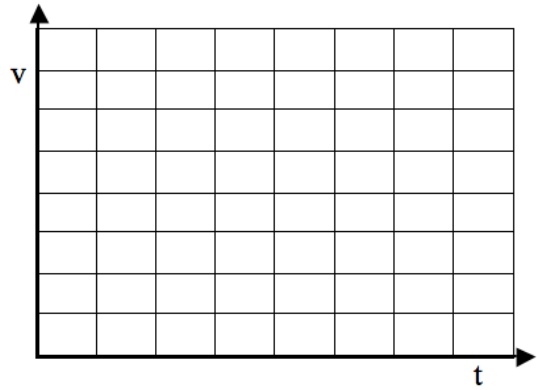
5. A car whose initial speed is 30 m/s slows uniformly to 10 m/s in 5 seconds.
- Make a well-labeled diagram of the situation.
  - Make a well-labeled graphical representation of the situation.
  - List given quantities and quantities to find.
    - Determine the acceleration of the car.
    - Determine the distance the car travels in the 3rd second (from  $t = 2\text{s}$  to  $t = 3\text{s}$ ).



6. A dog runs down his driveway with an initial speed of 5 m/s for 8 s, then uniformly increases his speed to 10 m/s in 5 s.
- Make a well-labeled diagram of the situation.
  - Make a well-labeled graphical representation of the situation.
  - List given quantities and quantities to find as you determine:
    - What was the dog's acceleration during the 2<sup>nd</sup> part of the motion?
    - How long is the driveway?



7. A physics student skis down a slope, with a constant acceleration of  $2.0 \text{ m/s}^2$  for 15 seconds.
- Make a well-labeled diagram of the situation.
  - Make a well-labeled graphical representation of the situation.
  - List given quantities and quantities to find as you determine the length of the slope.



8. A mountain goat starts a rock slide and the rocks crash down the slope 100 m in five seconds.
- Make a well-labeled diagram of the situation.
  - Make a well-labeled graphical representation of the situation.
  - List given quantities and quantities to find as you determine the acceleration of the rocks.

