

13. At high speeds, a particular automobile is capable of an acceleration of about  $0.50 \text{ m/s}^2$ . At this rate, how long does it take to accelerate from 90 km/h to 100 km/h?

$$90 \frac{\text{km}}{\text{hr}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1 \text{ hr}}{3600 \text{ s}} = v_0$$

$$100 \frac{\text{km}}{\text{hr}} \cdot " \cdot " = v$$

$$0.5 \text{ m/s}^2 \cdot \frac{3600 \text{ s}}{\text{hr}} \cdot \frac{3600 \text{ s}}{\text{hr}}$$

$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{\Delta t} = 0.50 \text{ m/s}^2$$

8. A rock thrown horizontally at a large bell 50 m away is heard to hit the bell 4.5 s later. If the speed of sound is 330 m/s, what was the speed of the rock? (Disregard the effect of gravity – in other words, ignore any vertical deflection of the rock).

Diagram illustrating the problem: A rock (represented by a cloud) is thrown horizontally at a large bell 50 m away. The distance is labeled 50m. A green arrow points from the rock to the bell, and a red arrow points back, representing the sound wave.

Handwritten equations and calculations:

$$v_r = \frac{d_r}{t_r}$$
$$v_r = \frac{50}{4.35}$$
$$v_r = 11.5 \text{ m/s}$$
$$v_s = \frac{d_s}{t_s}$$
$$330 = \frac{50}{t_s}$$
$$t_s = 0.15 \text{ s}$$
$$t = t_r + t_s$$
$$4.5 = t_r + 0.15$$
$$t_r = 4.35 \text{ s}$$

Additional handwritten notes:

$$s = \frac{d}{t}$$
$$330 \neq \frac{50}{4.5}$$

# Quizzes

## Homework quizzes:

- Cover a reviewed homework set
- make sure you have correctly solved all h/w problems in your notes
- OPEN HOMEWORK
- Unannounced

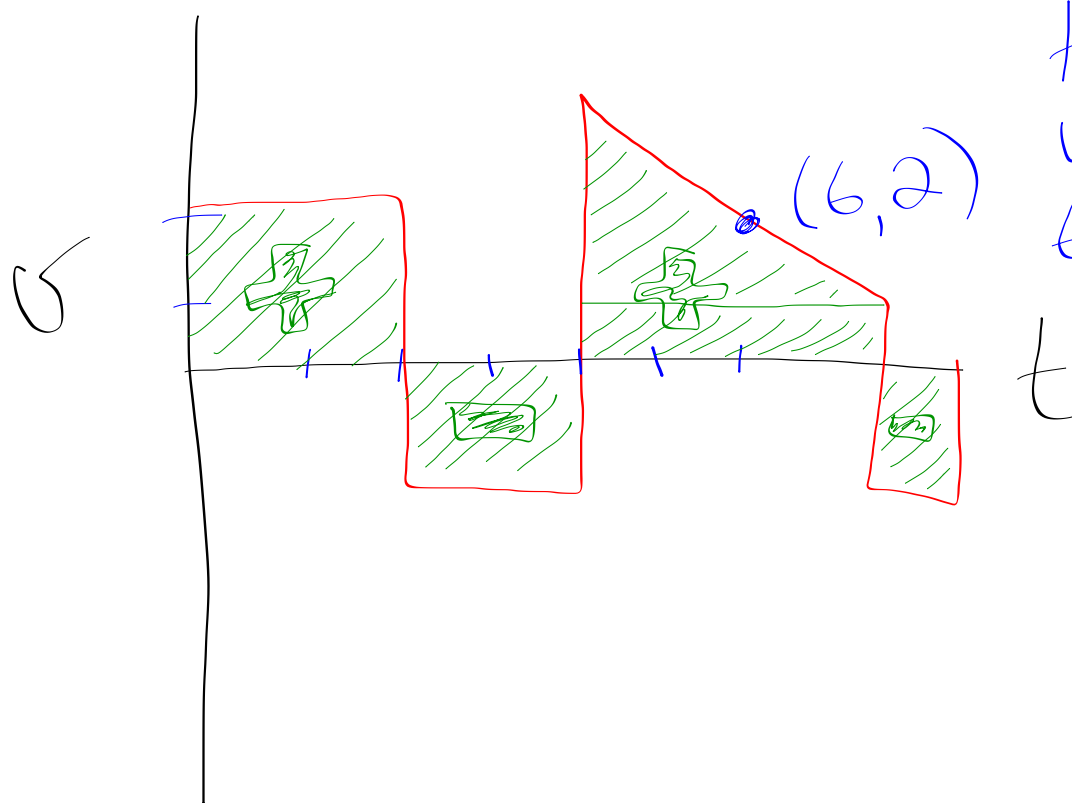
## Real quizzes:

- Over anything
- Closed-note
- Announced (~2 days in advance)
- Includes formulas, constants

# Quiz next Tuesday (9/27)

Over motion graphs •

- Convert  $x$ -,  $v$ -, and  $a$ -vs- $t$  graphs
- Understand  $+$ / $-$  values, slopes, zeroes
- Coordinates  $\pm$  area between the curve and the horizontal axis on a  $v$ -vs- $t$  graph?



the object has a  
velocity of  $2 \text{ m/s}$   
6 seconds after...