

# **UNIT 5 – MOTION IN 1D**

**IPOD Questions**

# IT'S *THE* PROBLEM OF *THE* DAY

## PROMPT # 20

A man in the city leaves his house and walks one complete block (4 sides) around his house, ending up at his front porch. Assume a city block is 100 m on each side and it took him 8 minutes.

Calculate  $d$ ,  $\Delta x$ ,  $s$  (in m/s) and  $v$  (in m/s).



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## PROMPT # 21

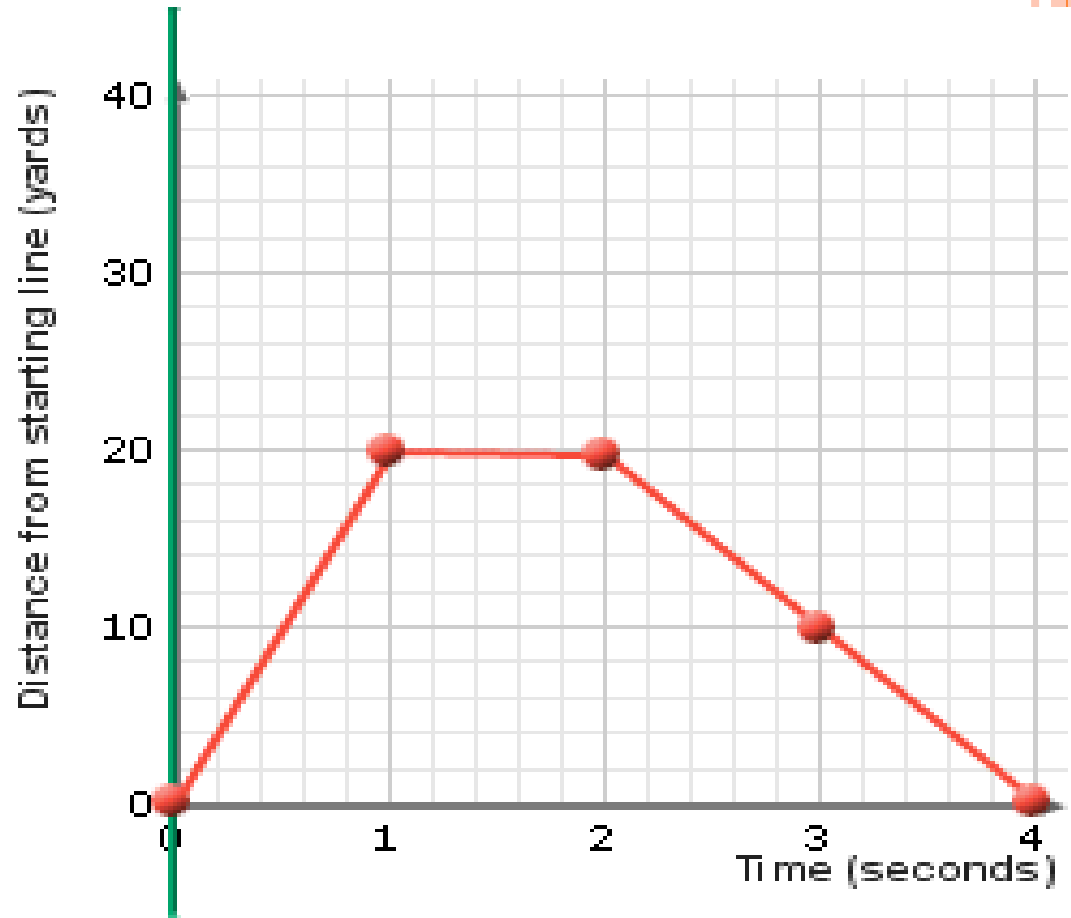
On your drive to school you drive at a speed of 25 mi/hr for 10 minutes and a speed of 35 mi/hr for 5 minutes. What is your average speed, in mph, for the entire trip?



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## PROMPT # 22

Describe the motion of the runner during each segment then draw the corresponding v vs. t graph.



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## PROMPT # 23

Complete **Practice with Graphs I**.  
Staple it into your IPOD books marked  
with this prompt #.



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## PROMPT # 24

While driving at  $+25$  m/s the light turns yellow and a car slows down to a stop. The car traveled  $+100$  m while stopping.

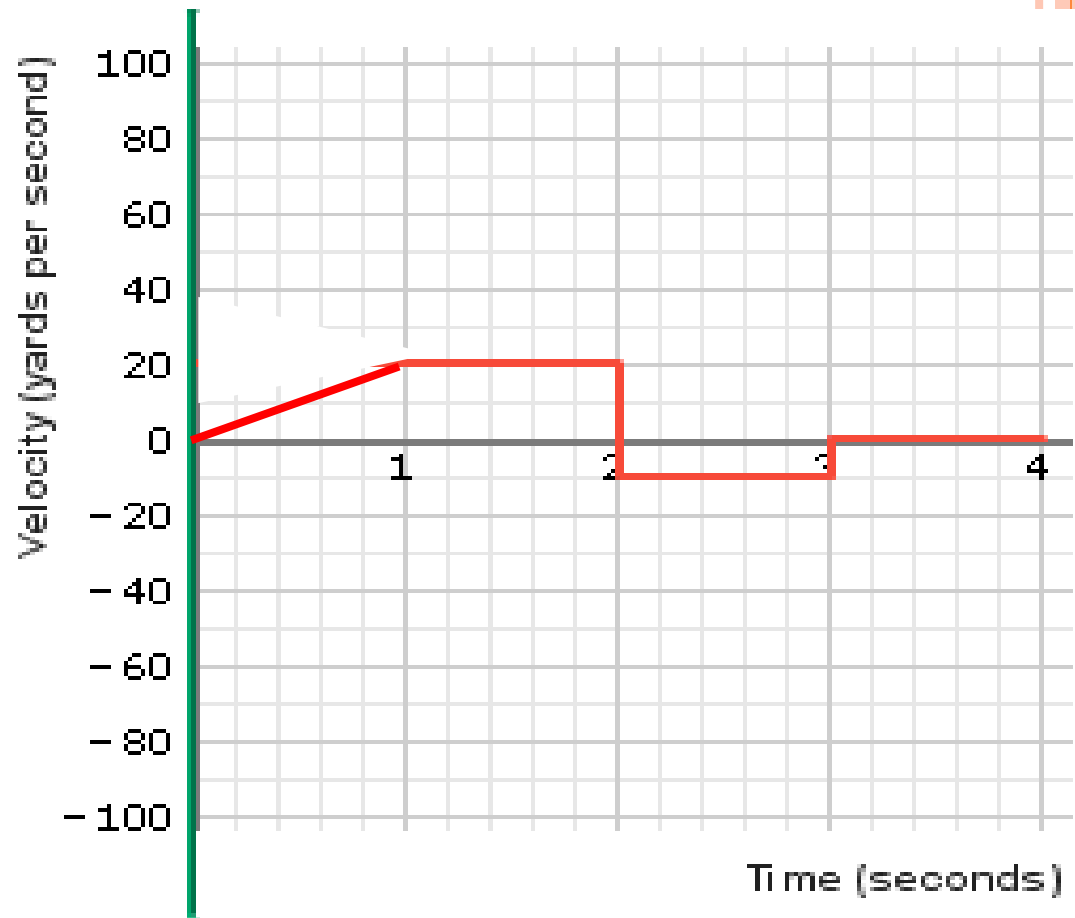
- a) What was the car's acceleration?
- b) How long did it take?



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## PROMPT # 25

Describe the motion  
of the runner  
during each  
segment then draw  
the corresponding  
x vs.t & a vs.t  
graphs.



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### PROMPT # 26 (Academic)

At the Olympic games, a bobsled accelerates from rest at a rate of  $+9 \text{ m/s}^2$  for 2.5 s.

- a) How far did the bobsled travel during this period of acceleration?
- b) What was the bobsled's final velocity?
- c) Draw the  $x$  vs.  $t$ ,  $v$  vs.  $t$  &  $a$  vs.  $t$  graphs for this motion.





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## PROMPT # 26 (Honors)

A sprinter explodes out of the starting block with an acceleration of  $+2.3 \text{ m/s}^2$ , which she sustains for  $1.2 \text{ s}$ . Then, her acceleration drops to zero for the rest of the race.

- a) What is her velocity (a) at  $t = 1.2 \text{ s}$  and (b) at the end of the race,  $t = 3.5 \text{ s}$ ?
- b) How far has the sprinter traveled during the entire race?
- c) Draw the  $x$  vs.  $t$ ,  $v$  vs.  $t$  &  $a$  vs.  $t$  graphs for this motion.

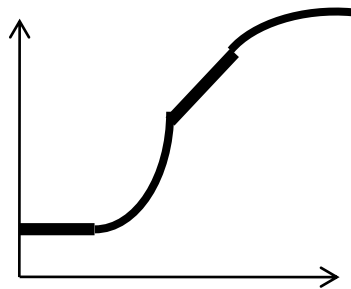


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## PROMPT # 27

Construct a velocity and acceleration vs. time graph for the following. Include a written description of the motion.

x vs. t



v vs. t



a vs. t



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## PROMPT # 28

Complete the following statement using vocabulary words from this unit:

**An acceleration of  
9.8 m/s<sup>2</sup> down means that....**



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### PROMPT # 29

A water balloon is shot straight into the air with an initial velocity of  $+30$  m/s. It then returns to the same position it was released from. Answer the following questions:

- a) What is the maximum height achieved by the balloon?
- b) How long did it take for the balloon to get to the top?
- c) What is the total time the balloon was in the air?
- d) What is the acceleration of the balloon at the top?
- e) What was the average velocity of the balloon?

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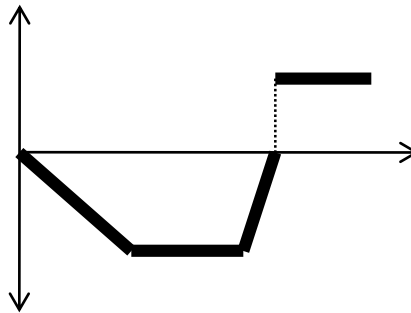
## PROMPT # 30

Construct a position, velocity and acceleration vs. time graph for the following. Include a written description of the motion.

x vs. t



v vs. t



a vs. t

