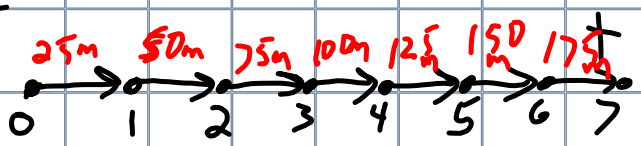
3/1/17 Cheetah Displacement Problem

Question: If a cheetah was traveling at 25 m/sec and ran for 7 sec, how far did the cheetah run?

1) Solve problem
2) Displacement Notes
3) Go Over & check SG
4) Jeopardy
5) Test Thursday



$175_m = 25\frac{m}{s} * 7sec$

$\Delta X = V * T$

How far

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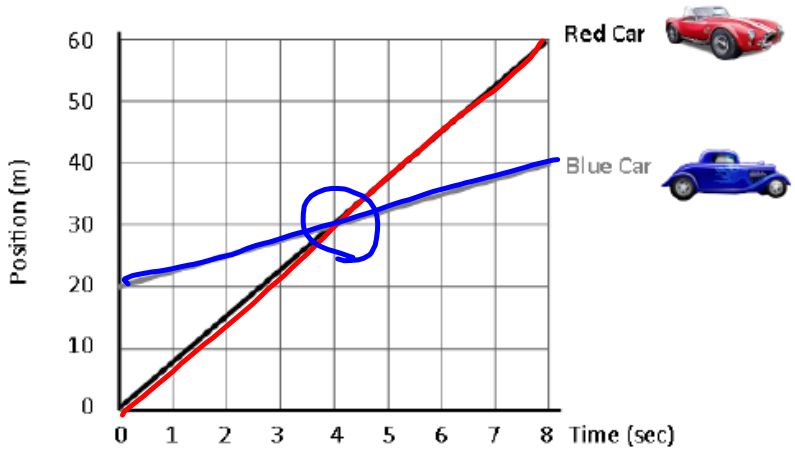
Aug 19-8:59 AM

A. Two cars were driving down the road and the resulting X/t graph was produced. Use this graph to answer the following questions.



1. What is the initial position of each car? Red 0m Blue 20m
2. What is the final position of each car? Red 60m Blue 40m
3. At what time did the two cars pass each other? 4 sec
4. At what position did the two cars pass each other? 30m
5. What is the velocity of the Red Car?

Given:
$X_f = 60m$
$X_i = 0m$
$T_f = 8sec$
$T_i = 0sec$

Formula: $V = \frac{X_f - X_i}{T_f - T_i}$

Work: $V = \frac{60m - 0m}{8sec - 0s} = \frac{60m}{8sec}$

Answer & Units $V = 7.5\ m/s$

6. What is the velocity of the Blue Car?

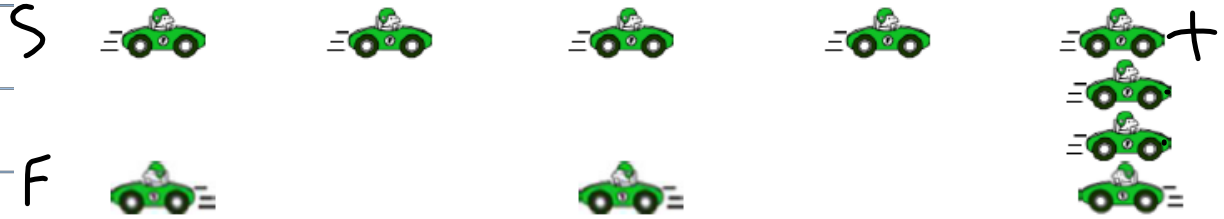
Given:
$X_f = 40$ $X_i = 20m$
$T_f = 8sec$ $T_i = 0sec$

Formula: $V = \frac{X_f - X_i}{T_f - T_i}$

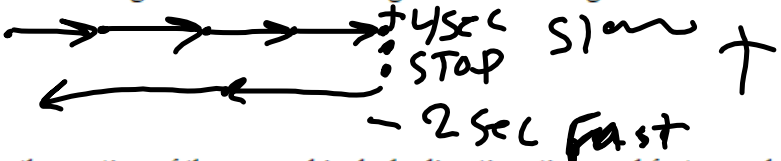
Work: $V = \frac{40 - 20m}{8 - 0sec} = \frac{20m}{8s}$

Answer & Units $V = 2.5\ m/s$

B. The green car was traveling and this was the path it took. The car is shown at each second in the path.



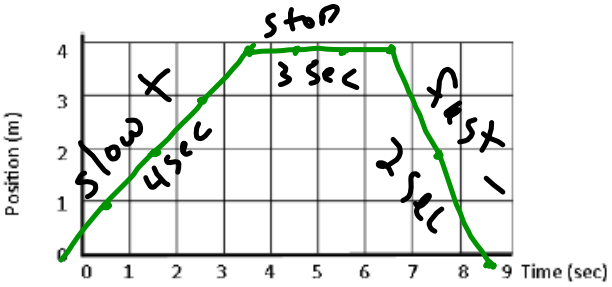
7. Draw a **motion diagram** from the car diagram above using dots for time and arrows for distance.



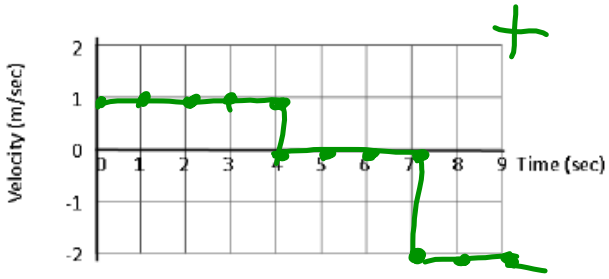
8. Describe the motion of the car and include direction, time and faster or slower velocities.

Positive direction slow for 4 sec, The car stops, for 2 sec, Turns around faster for 2 sec in the negative direction

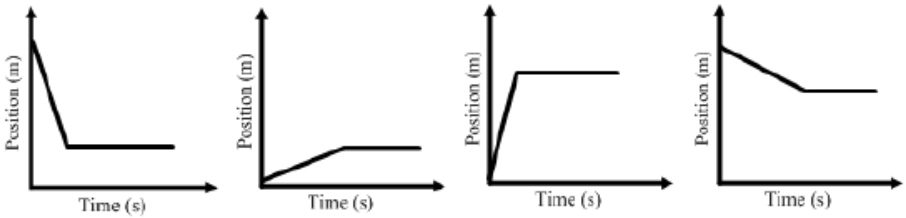
9. Now, create an X/t graph of the motion above.



10. Create a V/t graph of the motion above.



C. Use the following graphs for number 11-13.

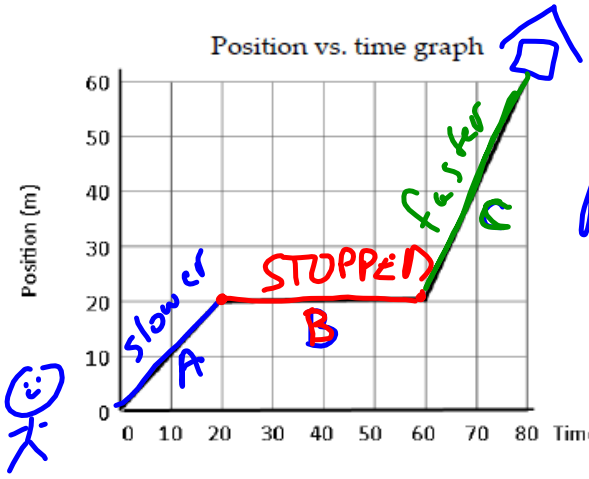


11. Which graph above shows an object moving slowly in the positive direction and then stopping?

12. Which graph above shows an object moving quickly in the positive direction and then stopping?

13. Which graph above shows an object moving slowly in the negative direction and then stopping?

D. A boy was walking to school. Below is a Position/time graph of his trip to school. Use this graph to complete a written description, motion diagram, and V/t graph.

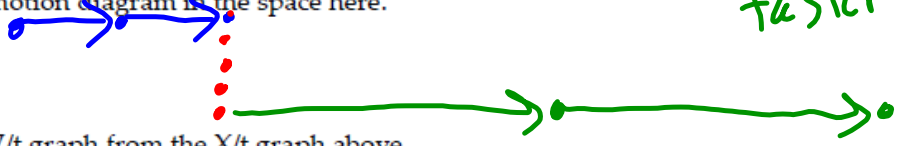


A = Boy walks + for 20 sec kinda slow constant

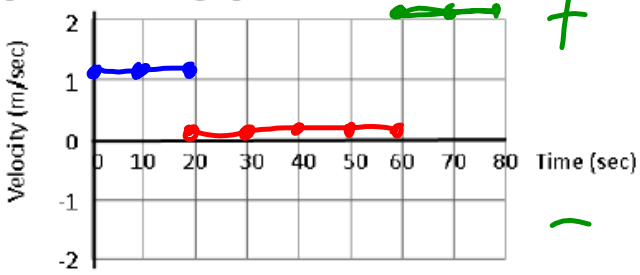
14. Give a written description from the graph above describing the motion of the boy walking to school.

B - Boy is at 20m for 40 sec
C - Ran for 20 sec in a + direction faster constant V.

15. Create a motion diagram in the space here.



16. Create a V/t graph from the X/t graph above.



E. Use the position vs. time graph to the right to answer number 13-17.

17. What is the **starting position** of the object in the graph? 80 m

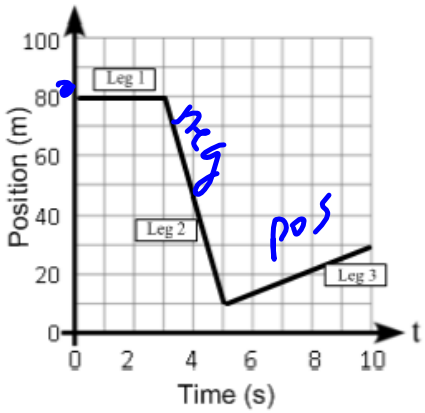
18. Which leg of the graph shows a **slower** velocity? leg 3

19. Which leg of the graph shows a **negative** velocity? leg 2

20. Which leg of the graph shows a **positive** velocity? leg 3

21. Which leg of the graph shows the object **not moving**? leg 1

Calculations



3

Tf Xi

22. A race car was timed for 20 seconds. If the initial position of the car was 25 meters and final position was 200 meters, what was the calculated velocity of the race car on the track?

Xf

Given: Tf=20sec Ti=0sec

Xf 200m Xi 25m

Unknown: V

Formula: $V = \frac{Xf - Xi}{Tf - Ti}$

Work: $V = \frac{200m - 25m}{20s - 0s} = \frac{175 m}{20 s}$

Answer & Units: V = 8.75 m/s

23. A horse was running with a constant velocity of 22 m/sec. If the horse ran for a total of 45 seconds, how far did the horse travel?

Given: V=22 m/s T=45sec

Unknown: ΔX

Formula: ΔX = V * T

Work: $\Delta X = 22 m/s * 45 sec$

Answer & Units: ΔX = 990m

V T

24. A sailboat was racing with a constant velocity of 7 m/sec. If the sailboat raced in one direction for 35 seconds, how far did the sailboat travel?

Given: V=7 m/s T=35sec

Unknown: ΔX

Formula: ΔX = V * T

Work: $\Delta X = 7 m/s * 35 sec$

Answer & Units: ΔX = 245 m

V

25. A cheetah was hunting prey. When the cheetah was running, it's initial position was 10m and final position was 150 meters. If the cheetah ran for 14 seconds, what was the cheetah's velocity?

Xf Tf Xi

Given: Xi=10m Ti=0sec Xf=150m Tf=14sec

Unknown: V

Formula: $V = \frac{Xf - Xi}{Tf - Ti}$

Work: $V = \frac{150m - 10m}{14sec - 0sec} = \frac{140 m}{14 s}$

Answer & Units: V = 10 m/s