Speed = distance / Time

Name _____

GRAPHS OF MOTION 1

60s = 1 min

1. A racer covered a 4500 m course in 18 minutes. Calculate the velocity in meters per second.

$v = \frac{s}{t} = \frac{4500\text{m}}{18\text{m/n}} \cdot \frac{60\text{s}}{1\text{min}} = 1080\text{s}$

$1080\text{s} \cdot \frac{1\text{min}}{60\text{s}} = 4.17\text{m/n}$

2. Jane ran at a constant speed of 2.75 m/s for 30 minutes. How far did she run in meters? Km?

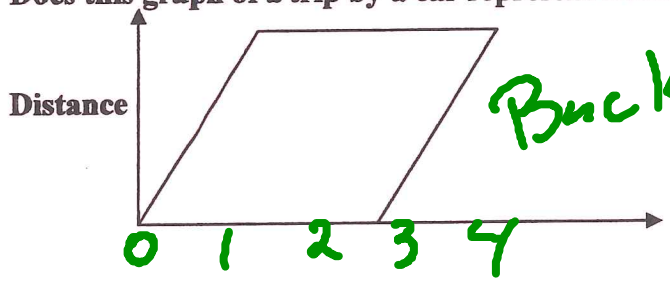
$s = vt = \frac{11\text{m}}{4\text{s}} \cdot 1800\text{s} = 4950\text{m} = 4.95\text{km}$

3. A photon of light travels at 3×10^8 m/s (the speed limit of the universe). If it takes light about 9 minutes to reach Earth from the sun, what is the Earth-Sun distance?

$s = vt = (3 \times 10^8 \text{m/s})(540\text{s}) = 1620 \times 10^8\text{m}$

$1.62 \times 10^{11}\text{m}$

4. Does this graph of a trip by a car represent a real situation? Explain.



NO

Buck in Time

5. A car drives on a road at a speed of 35 mph. Convert this into m/s and compare the distance the car travels in one second to the size of our classroom.

$35\frac{\text{miles}}{\text{HR}} \cdot \frac{1\text{m/s}}{2.237\frac{\text{miles}}{\text{HR}}} = 15.6\text{m/s}$

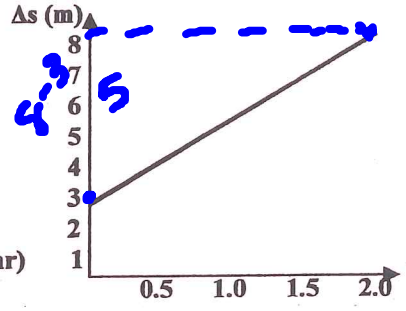
$1\text{m/s} = 2.237\frac{\text{miles}}{\text{HR}}$

6. Calculate the slope of the following graphs. Be sure to state units.

rise

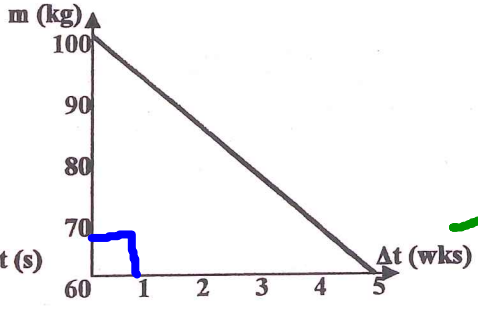
slope = speed

slope = rise/run = 200Km / 5HR = 40 Km/HR



4 / 5

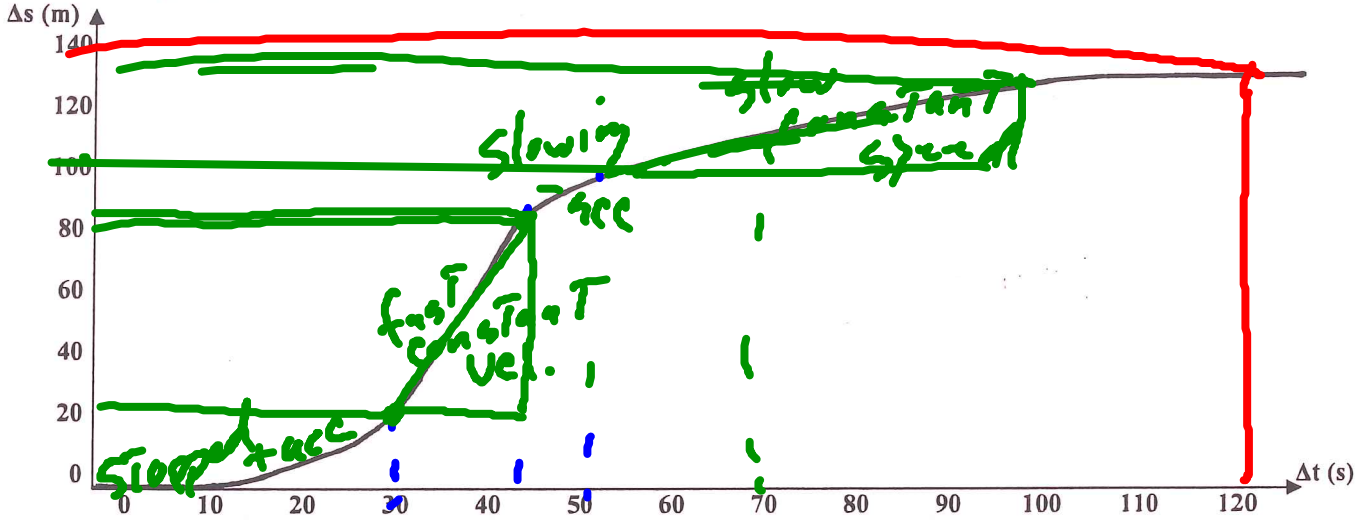
slope = rise/run = 5m/2s = 2.5 m/s



-10 KG / 5 WKS

slope = -2 KG/WKS

7. Refer to the graph.



a. Describe the "trip".

0-10 seconds stopped 10-30 acc Then 30-40 constant fast vel 40-50 slowing down 50-100 constant speed but slower 100-120 stopped

b. At what time is the person going the fastest? Calculate this speed.

30-40 second slope = $\frac{60m}{10s} = 6 m/s$

c. How fast is the person going at time 70 seconds?

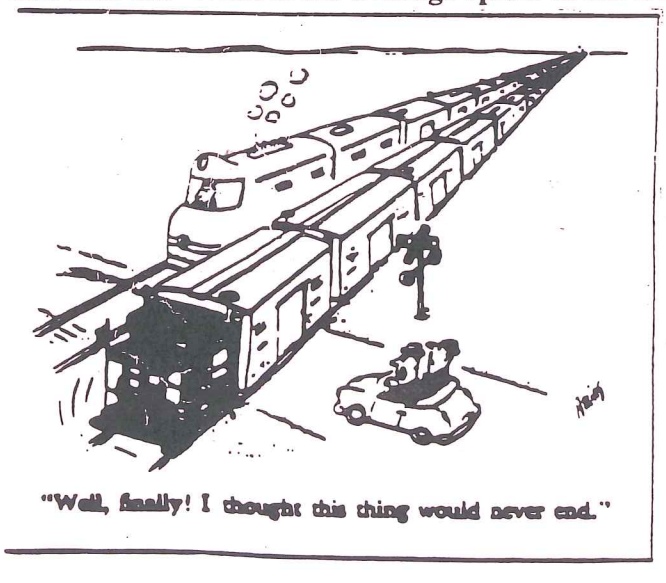
(B) slope = $\frac{30m}{5s} = \frac{3}{5} m/s = .6 m/s$

d. What is the average speed for the entire trip?

(A) $V = \frac{s}{t} = \frac{140m}{120s} = \frac{2 m/s}{6} = 1.16 m/s$

$s = vt$

8. A train travels 100 km/hr for 0.52 hr, then 50 km/hr for the next 0.24 hr, and finally 125 km/hr for the last 0.65 hr. What is the average speed of the train for this trip?


"Well, finally! I thought this thing would never end."

$V_{av} = \frac{s}{t} = \frac{\text{Total distance}}{\text{Total Time}} = \frac{145.25 \text{ Km}}{1.41 \text{ hr}}$

distance	
52 Km	.52
12 Km	.24
81.25	.65
145.25	1.41

103 Km/hr