1. State the number of significant digits

a. 431.92 5
b. 0.00430 3
c. 2001 4
d. 4300 2
e. 0.6700 4
f. 2000.003 7

2. Answer in the proper number of significant digits

a. 815 / 2.3
b. 5.6 x 0.045 x 2.83
c. 15.5 / 2.11
d. 8.1 x 22.10 x 110

(a) 354.347826 = 350

(b) 0.71316 = 0.71

(c) 7.34597 7.35

(d) 19691.1 => ~~20000~~ 2.0×10^4

3. Convert 1.7m/s to km/h

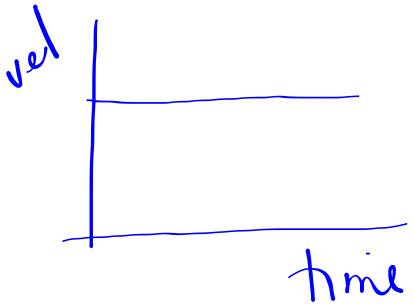
$$\frac{1.7\ m}{1\ s} \frac{\div 10 \div 10 \div 10\ km}{\div 60 \div 60\ h} = \frac{0.0017}{0.000277777\ldots} = 6.12\ \frac{km}{h}$$

$$\frac{1.7\ m}{s} \times \frac{1\ km}{1000\ m} \times \frac{3600\ s}{1\ h} = 6.12\ km/h$$

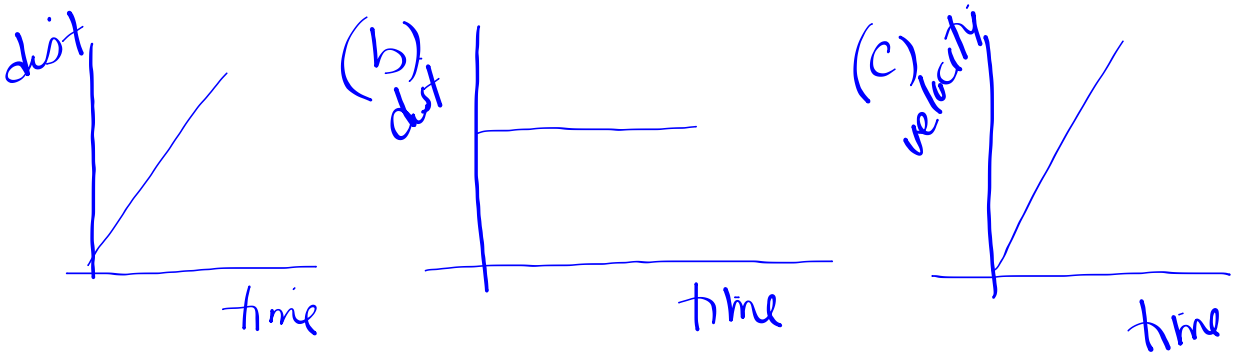
4. On a time-velocity graph, periods of no acceleration have what slope?

zero

const. velocity



5. a. Sketch a distance time graph showing constant velocity
   b. Sketch a distance time graph showing no velocity
   c. Sketch a velocity time graph showing constant acceleration



6. A car travels at a speed of 23.6 m/s. If the driver traveled for 32.4 s, find the distance covered?

6. $v = 23.6\ m/s$
$t = 32.4\ sec$
$d = ?$

$d = vt$
$= 23.6\frac{m}{s} \times 32.4\ s$
$= 764.64\ m.$
$= 765\ m$

7. A horse cantering across a field at 3.00 m/s is scared by a sudden noise and rapidly increases its pace. After 3.5 s, it is running at 5.4 m/s. find its average acceleration.

7. $a = ?$
$v_i = 3.00\ m/s$
$v_f = 5.4\ m/s$
$t = 3.5\ sec$

$a = \frac{v_f - v_i}{t}$
$= \frac{5.4 - 3.00}{3.5\ sec}$
$= 0.6857\ m/s^2$
$0.69\ m/s^2$

8. a. A van travels a distance of 31500 m in 56 minutes. Calculate the speed in m/s.
b. What is the speed in km/h

8. $d = 31500\ m$
$t = 56\ min$ } $56\ min \times \frac{60\ sec}{1\ min} = 3360\ sec$
$v = ?\ m/s$

$v = \frac{d}{t}$
$= \frac{31500\ m}{3360\ sec}$
$= 9.375\ m/s$
$9.375\ m/s$

b) $9.375\frac{m}{s} \times \frac{1\ km}{1000\ m} \times \frac{3600}{1\ hr} = 33.75\ km/h$

chart
$9.375\ m \div 10 \div 10 \div 10$
$1\ s \div 60 \div 60$

$34\ km/h$

9. Two cars travel the same distance. The first car travels at a speed of 39 m/s for 19 s and the second car travels for 14 s. Calculate the speed of the second car in m/s.

9. distance

~~car 1~~

$v = 39\ m/s$

$t = 19\ sec$

$d = ?$

$d = v\,t$

$= 39\frac{m}{s} \times 19\ s$

$= 741\ m$

second car

$d = 741\ m$

$V = ?$

$t = 14\ sec$

$V = \frac{d}{t}$

$= \frac{741\ m}{14\ sec}$

$= 52.929\ m/s$

$53\ m/s$

10. A last minute shopper strides briskly at 0.3 m/s through a mall toward a music store. Noticing the clerk starting to move the CD displays inside the store entrance and close the store, the shopper begins to speed walk and in 4 s in moving at 0.8 m/s. Find the average acceleration

10.

$V_i = 0.3\ m/s$

$V_f = 0.8\ m/s$

$t = 4\ sec$

$a = ?$

$a = \frac{V_f - V_i}{t}$

$= \frac{0.8\frac{m}{s} - 0.3\ m/s}{4\ sec}$

$= 0.125\ m/s^2$

$0.1\ m/s^2$ 1 sign. digit

11. After accelerating at a rate of 0.25m/s² for 8 s , a frog is swimming at 0.3 m/s. What was its initial speed?

11. $v_i = ?$
$v_f = 0.3\ m/s$
$a = 0.25\ m/s^2$
$t = 8\ sec.$

$v_i = v_f - at$
$= 0.3\frac{m}{s} - 0.25\frac{m}{s^2} \times 8\ sec.$
$= -1.7\ m/s$
$= -2\ m/s$

12. How long would it take a coyote accelerating at 0.8 m/s² to increase its speed from 0.7 m/s to 4.2 m/s?

12. $t = ?$
$v_i = 0.7\ m/s$
$v_f = 4.2\ m/s$
$a = 0.8\ m/s^2$

$t = \frac{v_f - v_i}{a}$
$= \frac{4.2\ m/s - 0.7\ m/s}{0.8\ m/s^2}$
$= 4.375\ sec$

13. A stunt man drops from the top of a building. If he accelerates at -9.8m/s² and hits a hugh air mattress on the ground in 8 seconds, what is his final velocity.

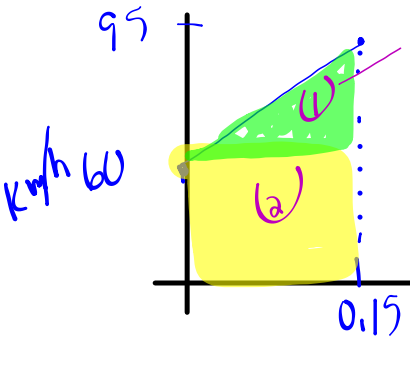
13. $a = -9.8\ m/s^2$
$t = 8\ sec$
$v_i = 0\ m/s$
$v_f = ?$

$v_f = v_i + at$
$= 0\ m/s + -9.8\ m/s^2 \times 8\ sec$
$= -78.4\ m/s$
$-80\ m/s$

14. A car moving at 60km/h accelerates to 95km/h in 0.15 hours. How far will the car travel as it accelerates.?

\# distance from acceleration!

Area under curve!

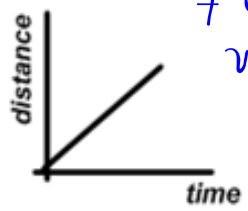


$A_1 = \frac{1}{2}(0.15)(35) = 2.625$

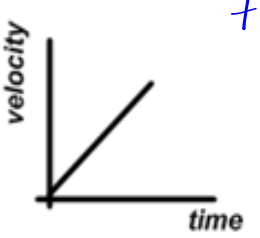
$A_2 = bh = 0.15(60) = 9$ km

total: $2.625 + 9 = 11.625$ km

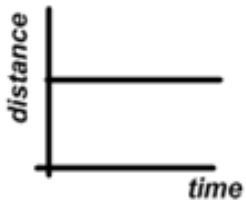
15. Describe the motion displayed by the following graphs



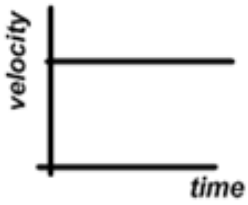
+ const velocity



+ const. acceleration

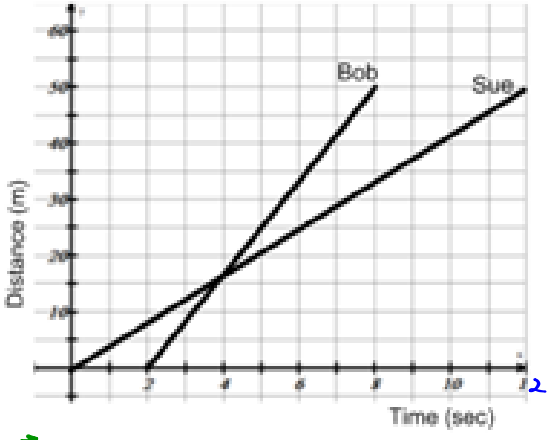


no speed stopped



const velocity no acceleration

16. a. Determine Bob and Sue's Speed
b. Who travelled the farthest?
c. Who travelled the longest?

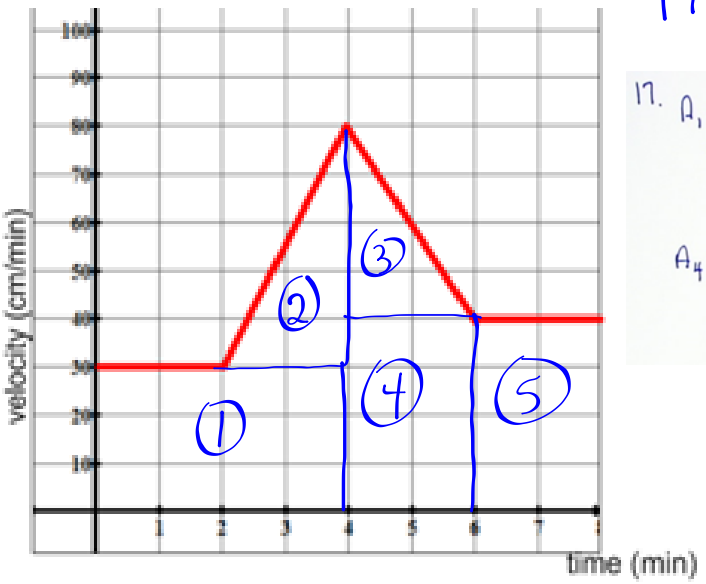


a) Bob Speed: $m_{(2,0)(8,50)} = \frac{50-0}{8-2} = \frac{50}{6}$ m/sec $= 8.3$ m/s

Sue Speed $m_{(0,0)(12,50)} = \frac{50-0}{12-0} = \frac{50}{12} = 4.16$ m/s

(b) They both travelled 50m (same distance)

(c) Sue travelled 12s, Bob travelled 8 sec } Sue longest



17. determine the total distance travelled

17. $A_1 = bh$ $= 4 \times 30$ $= 120$

$A_2 = \frac{1}{2}bh$ $= \frac{1}{2}(2)(50)$ $= 50$

$A_3 = \frac{1}{2}(2)(40)$ $= 40$

$A_4 = bh$ $= 2 \times 40$ $= 80$

$A_5 = bh$ $= 2 \times 40$ $= 80$

TOTAL 370cm

18. A skunk walking at 0.2 m/s begins to accelerate as it travels 32.5m farther along a trail. If its period of acceleration is 50 sec, what is its final speed?

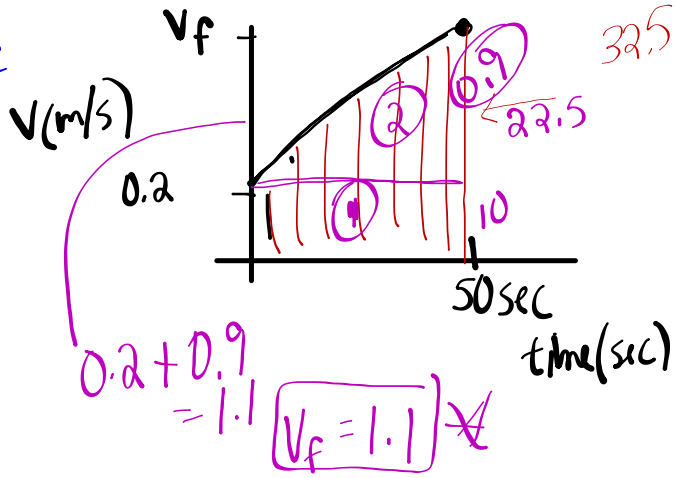
$V_i = 0.2 m/s$

$V_f = ?$

$d = 32.5m$

$t = 50 sec$

? How do you get distance when something is accelerating? (Area under curve)



32.5

$A_1 = 50(0.2)$

$= 10$

$A_2 = \frac{1}{2}(50)h$

$22.5 = 25h$

$\frac{22.5}{25} = h$

$0.9 = h$

$0.2 + 0.9$

$= 1.1$

$V_f = 1.1$

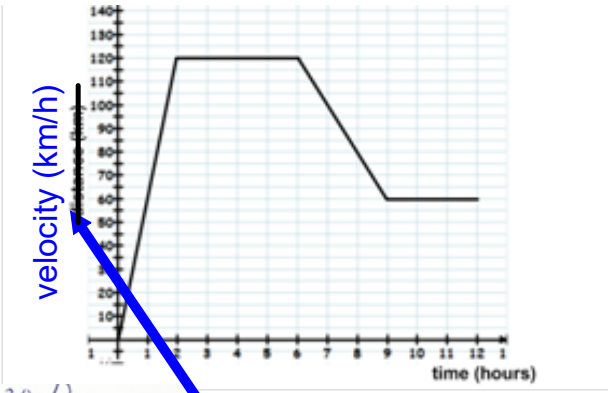
19. The graph on the right represents the velocity of an object over a 12 hour trip.

a. the average acceleration from 6 to 9 hours?

b. the average acceleration from 0 to 2 hours.

c. How far did the car travel from 2 to 6 hours

d. The total distance travelled during the entire journey



change this to velocity (km/h)

19. (a). $m_{(6,120)(9,60)} = \frac{120-60}{6-9} = \frac{60}{-3} = -20\ km/h^2$

(b) $m_{(0,0)(2,120)} = \frac{120-0}{2-0} = 60\ km/h^2$

(c) 2 to 6 hrs
Area = bh
= 4(120)
= 480 km

(d) TOTAL Area = 1050 km

20. Differentiate between an scalar and a vector quantity. Give an example of each

Scalar = magnitude only (size) Ex: 50 km

vector = magnitude (size) & direction Ex: 50 km North

21. An actor walks 23 feet stage right and then 15 feet and finally 3 feet stage left.

Find the resultant displacement

resultant 35 feet right