

Sense because the time is negative

~~4.1~~

4.1

0.0058 seconds

4.2

the next pulse could interfere with the previous

One

4.3

~~4.4~~ + 7.15 m or more

8.575

4.4

$t(s)$	Pos. (m)	$V (m/s)$	$a_{avg} (m/s^2)$
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$$v = \frac{\Delta d}{\Delta t} = \frac{0.05}{0.05} \rightarrow d = \sqrt{t}$$

4.4

$$V_2 = \frac{x_2 - x_1}{t_2 - t_1}$$

Time(s)	Position(m)	V(m/s)	a _{avg} (m/s ²)
0.01	0.5405	N/A	N/A
0.02	0.582	4.15	N/A
0.03	0.6245	4.25	10
0.04	0.668	4.35	10
0.05	0.7125	4.45	10

Time(s)	Position(m)	V(m/s)	a _{avg} (m/s ²)
0.01	0.541	N/A	N/A
0.02	0.582	4.1	N/A
0.03	0.625	4.3	20
0.04	0.668	4.3	0
0.05	0.713	4.5	20

$$a = \frac{(\Delta v)}{(\Delta t)}$$

0.05	0.713	2.5	-380
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4.5

the position was rounded to 3 decimal places

4.6

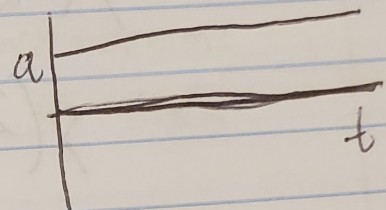
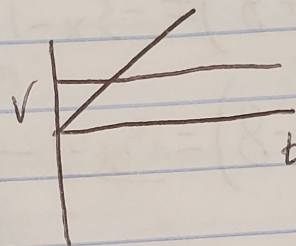
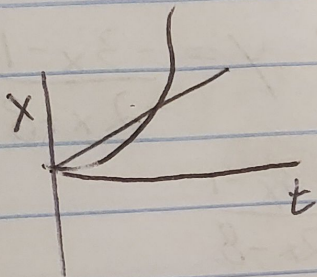
the first device is more precise

4.7

rounding slightly changes both the v and a

III

4.8

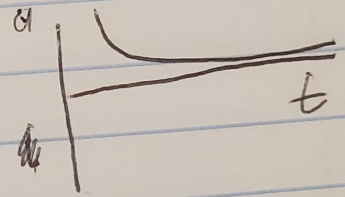
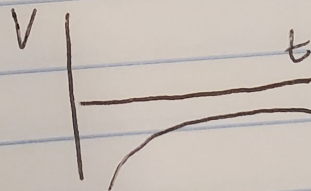


~~yes~~

yes

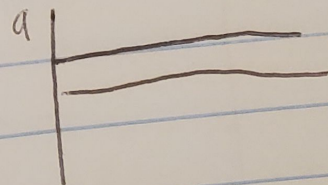
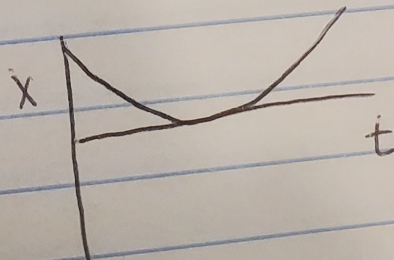
4.9

Desc.
velocity decreases
non-linearly



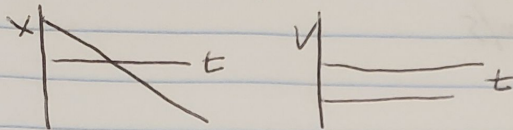
4.10

Desc.
linearly
increasing
velocity



PHYS 407

11. yes, starting away from origin and moving closer to it

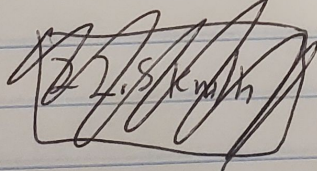


12. yes, start at negative velocity and accelerate in opposite direction

13. no, running at a constant speed in a circle is still accelerating

14. yes, a ball gets thrown up in the air, at the apex, its velocity is zero but its acceleration is still -9.8 m/s^2

15. V_{BL2} upstream: V_{BL1} downstream:
~~22.5~~ 22.5 km/h 45 km/h



$$V_{BL1} = V_{BR} + V_{BL2} + V_{BR}$$

$$-V_{BL2} \quad -V_{BL2}$$

$$V_{BL1} - V_{BL2} = 2V_{BR} \rightarrow \frac{45 - 22.5}{2} = V_{BR} = 11.25 \text{ km/h}$$

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$$45 \text{ km/h} - 11.25 \text{ km/h} = \boxed{33.75 \text{ km/h}}$$