

LAMC Physical Science 1 Homework #2

Ch 2

Matching

a.9

c.11

d.17

e.7

l.8

k.18

o.6

q.13

Multiple Choice

1.d

3.d

5.d

6.b

8.d

10.d

Fill in the blank

1. Position

4. distance

6. constant or uniform

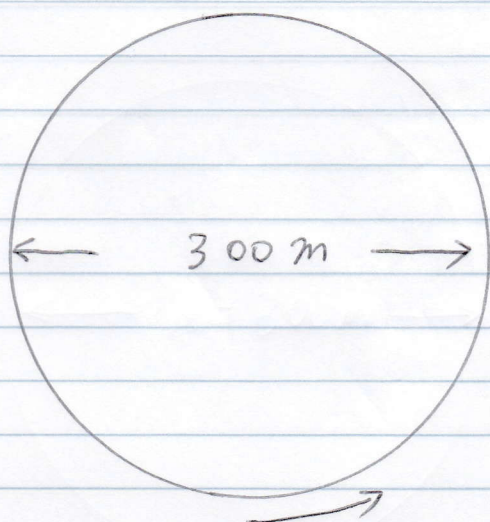
8. free fall

9.m/s²

ch 2

Exercises.

4.



Diameter is 300 m
, so radius is $r = 150 \text{ m}$.

circumference of a circle
is $2\pi r$

radius $r = 150 \text{ m}$ $d = 2\pi r$ $t = 10 \text{ min}$ $S = ?? \text{ m/s}$	$S = \frac{d}{t}$ $= \frac{2 \times \pi \times 150 \text{ m}}{10 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}}$ $= 1.5707 \text{ m/sec}$ $= 1.6 \text{ m/sec}$
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* t has the least number of significant figures (two), so our final answer should have two significant figures.

6.



$$d = 750 \text{ mi}, t = ??, s = 55.0 \text{ mi/h}$$



$$\begin{array}{l} d = 750 \text{ mi} \\ s = 55.0 \text{ mi/h} \end{array}$$

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

$$t = ?? \text{ hr}$$

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

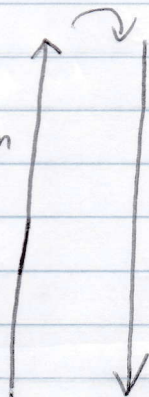
$$= \frac{750 \text{ mi}}{55.0 \text{ mi/h}} = \boxed{13.6 \text{ hours}}$$

* Here, 750 mi and ~~55.0 mi/h~~ 55.0 mi/h have three significant figures, so the answer should have three sig. figure.

10 (b)

$$\begin{array}{l} 0.750 \text{ km} \\ 20.0 \text{ s} \end{array}$$

$$\begin{array}{l} 0.750 \text{ km} \\ 25.0 \text{ s} \end{array}$$



$$\begin{array}{l} \vec{d} = 0 \\ t = 45.0 \text{ s} \end{array}$$

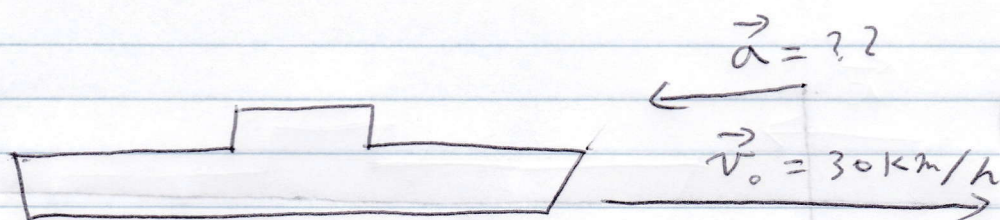
$$\vec{v} = ??$$

$$\begin{array}{l} \vec{v} = \frac{\vec{d}}{t} \\ = 0. \end{array}$$

Since displacement is zero,

$$\boxed{\vec{v} = 0}$$

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time to stop $t = 20 \text{ min}$ distance $d = 5.0 \text{ km}$

(a)

$$\vec{v}_0 = 30 \text{ km/h}$$

$$\vec{v}_f = 0 \text{ km/h}$$

$$t = 20 \text{ min}$$

$$\vec{a} = ?? \text{ m/s}^2$$

$$\vec{a} = \frac{\vec{v}_f - \vec{v}_0}{t}$$

$$= \frac{0 \text{ km/h} - 30 \text{ km/h}}{20 \text{ min}}$$

$$= -30 \frac{\text{km}}{\text{h}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ h}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}}$$

$$\times \frac{1}{20 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ sec}}$$

↳ convert 30 km/h to m/s.

↳ convert 20 min to sec.

$$= -\frac{30 \times 1000}{20 \times 60 \times 60 \times 60} \text{ m/s}^2$$

$$= 0.0069 \text{ m/s}^2$$

$$= 6.9 \times 10^{-3} \text{ m/s}^2$$

(b)

$$\vec{d} = 5.0 \text{ km}$$

$$t = 20 \text{ min.}$$

$$\vec{v}_{\text{ave.}}$$

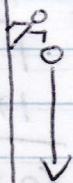
$$\vec{v}_{\text{ave}} = \frac{\vec{d}}{t}$$

$$= \frac{5.0 \text{ km}}{20 \text{ min}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ min}}{60 \text{ sec}}$$

$$= \frac{5.0 \times 1000}{20 \times 60} \text{ m/s}$$

$$= 4.2 \text{ m/s}$$

18.



$$t = 3.0 \text{ sec}$$

$$a = g = 10 \text{ m/s}^2$$

(a)

$$v_0 = 0$$

$$v_f = ??$$

$$t = 3.0 \text{ sec}$$

$$a = 10 \text{ m/s}^2$$

$$v_f = v_0 + a t$$

$$= 0 + \frac{10 \text{ m}}{\text{sec}^2} \times 3.0 \text{ sec}$$

$$= 30 \frac{\text{m}}{\text{sec}} \times \frac{1 \text{ mi}}{1610 \text{ m}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}}$$

$$= \frac{30 \times 60 \times 60}{1610} \text{ mi/hr} = \boxed{67 \text{ mi/hr}}$$

If this is a heavy object, it can be dangerous

(b)

$$v_0 = 0$$

$$t = 3.0 \text{ sec}$$

$$g = 10 \text{ m/s}^2$$

$$d = ?? \text{ m}$$

$$d = \frac{1}{2} g t^2$$

$$= \frac{1}{2} 10 \frac{\text{m}}{\text{s}^2} \times (3 \times 3) \text{ s}^2$$

$$\boxed{= 45 \text{ m}}$$

If we assume height of one floor is 3 m,
the dormitory has 15 floors