#1

a) $\frac{5280 f}{mi} \cdot \frac{12 in}{f} \cdot \frac{2,54 cm}{1 in} \cdot \frac{100 cm}{1 m} \cdot \frac{3600 s}{1 h}$

To get the answer in $\left(\frac{mi}{h}\right)$ we should multiply it by $\left(\frac{m}{s}\right)$ so:

$\frac{5280 f}{mi} \cdot \frac{12 in}{f} \cdot \frac{2,54 cm}{1 in} \cdot \frac{100 cm}{1 m} \cdot \frac{3600 s}{1 h} \cdot \frac{m}{s}$

$= \frac{cm^2}{mi \cdot h}$ so a is not correct ($\neq mi/h$)

b) $\frac{5280 f}{mi} \cdot \frac{12 in}{f} \cdot \frac{1 in}{2,54 cm} \cdot \frac{1 m}{100 cm} \cdot \frac{1 h}{3600 s} \cdot \frac{m}{s}$

$= \frac{in^2 \cdot m^2 \cdot h}{mi \cdot cm^2 \cdot s^2}$ so the answer b is $\neq mi/h$ ~~(...)~~ b is not ~~(correct)~~ the correct answer

c) $\frac{5280 f}{mi} \cdot \frac{12 in}{f} \cdot \frac{2,54 cm}{1 in} \cdot \frac{100 cm}{1 m} \cdot \frac{1 h}{3600 s} \cdot \frac{m}{s}$

$= \frac{cm^2 \cdot h}{mi \cdot s^2}$ so the answer C is $\neq mi/h \Rightarrow$ C is not the correct answer

d) $\frac{1\,mi}{5280\,ft} \cdot \frac{1\,ft}{12\,in} \cdot \frac{1\,in}{2{,}54\,cm} \cdot \frac{100\,cm}{1\,m} \cdot \frac{3600\,s}{1\,h} \cdot \frac{m}{s}$

$= mi/h$ so d is the correct answer

10

e) $\frac{1\,mi}{5280\,ft} \cdot \frac{1\,ft}{12\,in} \cdot \frac{1\,in}{2{,}54\,cm} \cdot \frac{1\,m}{100\,cm} \cdot \frac{3600\,s}{h} \cdot \frac{m}{s}$

$= \frac{mi \cdot m^2}{cm^2 \cdot h}$ e is not the correct answer ($\neq mi/h$)

The correct answer is d

#2 $\left[\frac{ML}{T^2}\right] = ?$

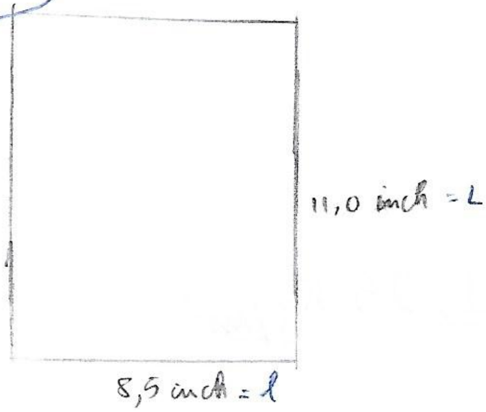
As we know: $V = \frac{L}{T}$ and $L = U \cdot T$ and $T = \frac{L}{V}$ ⇓ $T^2 = \frac{L^2}{V^2}$

→ Replacing L and T in $\left[\frac{ML}{T^2}\right]$

$\frac{M \cdot V \cdot T}{\frac{L^2}{V^2}} = \frac{M \cdot V \cdot T \cdot V^2}{L^2} = \frac{M \cdot V \cdot \frac{L}{V} \cdot V^2}{L^2}$ 10

also $L^2 = r^2$ ($L = r$) (distance, length, radius)

#3 | #3 |



- 1 inch ⟶ 2,54 cm
  8,5 inch ⟶ x ? cm

- 1 inch ⟶ 2,54 cm
  11 inch ⟶ y ? cm

$$X = \frac{8,5_{\text{inch}} \times 2,54_{\text{cm}}}{1 \text{ inch}} = \boxed{21,59 \text{ cm}}$$

$$y = \frac{11 \text{ inch} \times 2,54 \text{ cm}}{1 \text{ inch}} = \boxed{27,94 \text{ cm}}$$

The area of the exam paper in cm^2 is:

$$A = L \times l = 21,59_{\text{cm}} \times 27,94_{\text{cm}}$$

$$= 603,2 \text{ cm}^2$$ ✓

The answer is e (603 cm^2).

10/

#4 $\rho = \frac{m}{V}$ (m in Kg, V in m^3)

$\rho_{water} = 1000 \ Kg/m^3$

$\rho_{air} = \frac{1}{800} \rho_{water} = \frac{1}{800} \times 1000 = \boxed{1,25 \ Kg/m^3}$

So, $\rho_{air} = \frac{m_{air}}{V}$

10/

$\rightarrow 1,25 \ Kg/m^3 = \frac{m_{air}}{5,0m \times 8,0m \times 3,0m}$

$m_{air} = 1,25 \ Kg/m^3 (5,0m \times 8,0m \times 3,0m)$

$\boxed{m_{air} = 150 \ Kg}$ ✓

10/

#5 The graph (e) ✓ correctly represents the position versus time of the object, because the position of the object begins far from each other then they get closer but do not stop from moving (not a complete stop the dots does not touch each other) then they get far from each other (there is an acceleration).

Also the graph (e) is correct because graph (a) and (b) shows a constant acceleration which is not applicable on the representing of the dots (...)

#6) $V_t = 10\ cm/s = 0,1\ m/s$ and $V_H = 2\ m/s$

#6) $d = 20\ cm = 0,2\ m$ $t = 2\ min = 120\ s$ (1 min → 60 s; 2 min → x; $x = \frac{2\ min \times 60\ s}{1\ min} = 120\ s$)

$V = \frac{d}{t}$ (T : duration of the race; x : distance; V : speed)

$d = V \times t$

Let $T = X_{tortoise}$

$20(T - 120) = X - 20$ (distance traveled by the hare)

$20x - 2400 = X - 20$

$20x - x = 2400 - 20$

$19x = 2380$

$x = \frac{2380}{19} = 125,26\ cm$ ✓

10/

#7) $a = 0$ $V_1 = 5\ m/s$ A → B

$a = 0$ $V_2 = 3\ m/s$ B → A

a) $Avg_{speed} = \frac{V_1 + V_2}{2} = \frac{5\ m/s + 3\ m/s}{2} = \frac{8\ m/s}{2} = 4\ m/s$ ✗ 3.75 m/s

b) $V_{avg} = \frac{\Delta x}{\Delta t} = 0$ because the ~~atten~~ person goes from A to B then from B to A so there is no desplacment (comes back to the initial point).

$\frac{5}{10}$

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total = $\frac{65}{70}$