Nom :

PHYS 11



MOCK Final exam

UAM + Newton's laws

| UAM acceleration | UAM velocity | UAM position | Newton's 2nd law |
|---------------------------|----------------|------------------------------------|------------------|
| $a = \frac{v_2 - v_1}{t}$ | $v = at + v_0$ | $x = \frac{1}{2}at^2 + v_0t + x_0$ | $F = m \cdot a$ |

Exercise 1 (5 points) A car traveling at 144 km/h constantly brakes until it stops after 10 seconds.

| a) Make a drawing of the situation: | | |
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| b) What is the distance travelled during the braking? | | |
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| c) What is its velocity 5 seconds after the start of braking? | | |
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Exercise 2 (5 points) The system represented below is in equilibrium.

- a) Draw the weight $\overrightarrow{F_1}$ of the lamp, knowing that its magnitude is 60 N and that 1 square represents 10 N.
- b) Draw precisely (on scale) the two other forces $\overrightarrow{F_2}$ and $\overrightarrow{F_3}$ that act each on a wire.
- c) What is the magnitude of F_2 ?
- d) What is the magnitude of F_3 ?



Exercise 3 (5 points) A 60 kg cart is pulled with a force of 120 N on a strait horizontal road.

a) Make a drawing of the situation:

a) Calculate the acceleration of the cart:

b) Calculate its velocity after 4 seconds:

Exercise 4 (5 points) A trolley has a mass of 10 tons. Initially on rest, it acquires a velocity of 108 km/h after 2 min.

a) Give the final velocity of the trolley in m/s:

| b) Calculate the acceleration of the trolley: | c) Calculate the force acting on the trolley: |
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