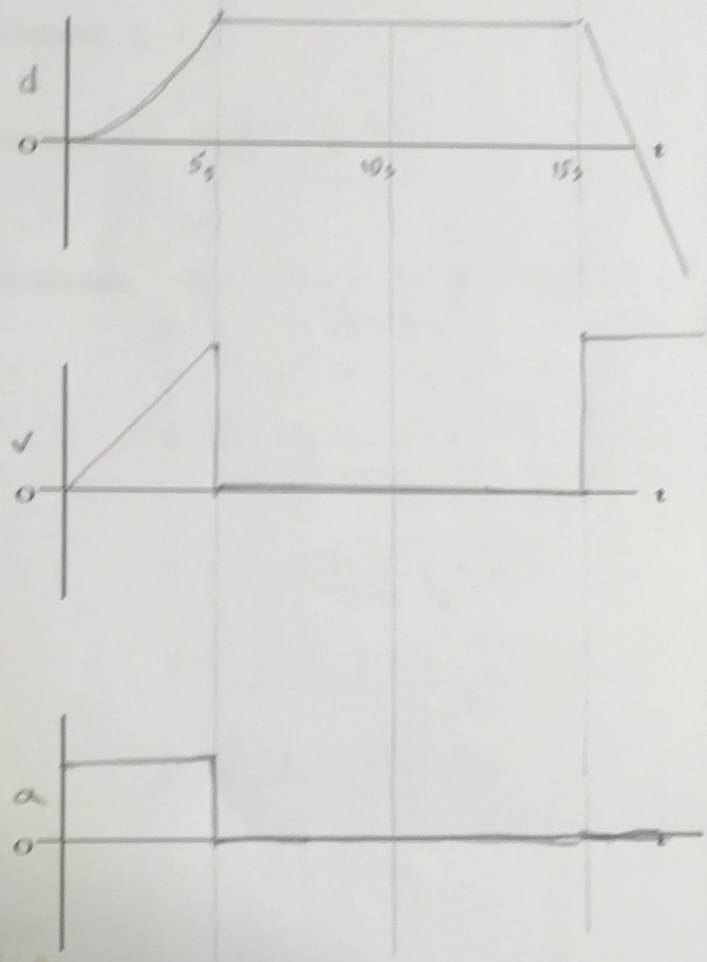
The STOP MONKEYING AROUND quiz ☺

1) While trying to write this quiz, YOU are attacked by a banana-throwing monkey! To avoid being hit, you accelerates away from your desk for 10m (which takes 5 seconds), hide behind a wall for 10 seconds, and then runs past your desk at a constant velocity for 15 m.

a) **SKETCH** the displacement vs time, velocity vs. time & acceleration vs. time graphs (6 marks)



b) What was your initial acceleration when hiding from the monkey? (4 marks)

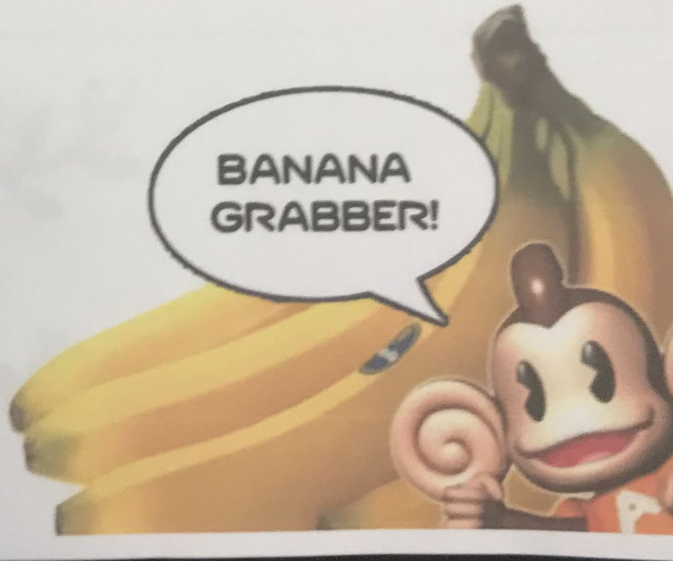
Givens: $v_i = 0 m/s$
$d = 10m$
$t = 5s$

Unknown: $v_f = ?$
$\vec{a} = ?$

Equation: $d = v_i t + \frac{1}{2} a t^2$

Substitution: $10 = 0(5) + 0.5a(5)^2$
$10 = 0.5a(25)$
$\frac{10}{25} = 0.5a$
$\frac{2}{5} = 0.5a$

Solve: $\frac{0.4}{0.5} = a$
$a = 0.8 m/s^2$



2) The monkey is perched on a vine 5m above the ground. If the monkey throws the banana up in the air at 12m/s:

a) When did the banana land on the ground? (4 marks)

Givens: $d = -5\,m$

$v_i = 12\,m/s$

$\vec{a} = -9.80\,m/s^2$

Unknown: $t = ?$

Equation: $d = v_i t + \frac{1}{2} a t^2$

Substitution: $-5 = 12t + 0.5(-9.80)t^2$

$0.5(-9.80)t^2 + 12t + 5 = 0$

$-4.9t^2 + 12t + 5 = 0$

$$t = \frac{-12 \pm \sqrt{12^2 - 4(-4.9)(5)}}{2(-4.9)}$$

$$t = \frac{-12 \pm \sqrt{242}}{-9.8}$$

$$t = \frac{-12 - 15.5563}{-9.8}$$

$$t = \frac{-27.5563}{-9.8}$$

$t = 2.81s$

Solve:

b) How fast was the banana going when it hit the ground? (4 marks)

Givens: $d = -5\,m$

$v_i = 12\,m/s$

$\vec{a} = -9.80\,m/s^2$

$t = 2.81s$

Unknown: $v_f = ?$

Equation: $v_f = v_i + at$

Substitution: $v_f = 12 + (-9.8)(2.81)$

$v_f = 12 + (-27.538)$

$v_f = -15.538$

$v_f = 15.54\,m/s$

Solve: