Newton's Laws 2: *ANSWERS*

1.

   (a) A *force* that acts to oppose motion

   (b) The *force* of gravity

   (c) An object's ability to resist *change* in motion

2. The accelerations will be opposite in direction. The van will accelerate less than the skateboarder. Assuming no friction, they will continue at constant speed away from each other forever.

   (explanation must include use of two of the following:)

   I. Things keep going or stay stopped unless pushed/pulled

   II. Heavier things are harder to push/pull

   III. Every action has an equal and opposite reaction

3.

   (a) 9.8 ms^{-2}

   (b) Air resistance increases with speed. Eventually the air resistance equals weight, so the net force is zero (hence acceleration is zero).

4. The lead feather has more inertia, so the force of air resistance has less effect.

   Or, The lead feather has more weight, so its net force is greater (this answer is *only* valid if it's clear friction is involved e.g. *net* force).

5.

   (a) W = mg = 70×9.8 = 686 N (690 N to 2 s.f.)

   F_{net} = 686 – 200 = 486 N (490 N to 2 s.f.) *downwards*

   (b) a = F / m = 486 / 70 = 6.9 ms^{-2}

   (c)
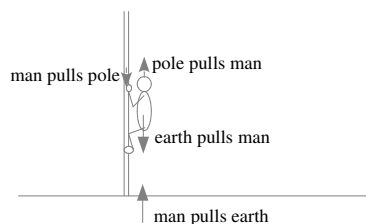
6.

   (a)

	$\sqrt{h}$	
	1.0	
	1.4	
	1.7	
	2.0	

   (b) Minimises the effect of random error. (or something similar)