Unit 3 - Causes of Motion Exercise 4 - Applications of Newton's 2nd Law

For each of the following draw a) cartoon, b) system schema, c) force diagram, and c) force addition diagram. Show all general equations and your solution.

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1.	Alfonso pushes a box on a well waxed (frictionless) floor to the right with a 20 N force causing it to accelerate at $1.5~\text{m/s}^2$. What is the mass of the box?
2.	The Jamaican bobsled team applies a force of 500 N to their 75 kg sled. What is the acceleration of the sled (assume the ice is frictionless)?
3.	A $2.00 \ \text{kg}$ cart on a frictionless track is pulled by force of $3.00 \ \text{N}$. What is the acceleration of the cart?

4. A 3.00 kg cart on a frictionless track is pulled by a string so that it accelerates at 2.00 m/s/s. Verification the string?	What is
5. A 70.0 kg skydiver falls towards the earth. If the force due to air resistance is 0 N, what is the eration of the skydiver?	ne accel-
6. The skydiver in problem 5 opens her chute. The force due to air resistance is now 1200 N. Yethe acceleration of the skydiver?	What is

7. A 0.500 kg model rocket is initially pushed upwards by a thrust force of 15 N. If the force of sistance is 1.00 N, what is the initial acceleration of the rocket?	of air re-
Bonus - A man pushes his child in a grocery cart. The total mass of the cart and child is $30.0 \mathrm{kg}$ force of friction on the cart is $15.0 \mathrm{N}$, how hard does the man have to push so that the cart acceleration $1.50 \mathrm{m/s/s}$.	. If the erates at