Applied Forces on an Incline

Solve the following problems

1. A person pushes a 30kg lawnmower up 35° degree set of ramps. The person pushes at 20° to the incline. What force must the person push at to accelerate the lawnmower up the incline at $1m/s^2$. How could the person use less force but have the same acceleration?



2. A person pushes a cart up a hill that has an angle of 25° . The person makes and angle of 20° with the incline. If the cart is 30kg and accelerates up the frictionless incline at $2m/s^2$ how much force is the person pushing with?



3. A person pulls a shopping cart up a 15° incline backwards with 70N of force. The angle the person pulls at is 10° to the incline. If the cart has a mass of 12kg. What is the acceleration of the cart?



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4. A person pulls up at $a50^{\circ}$ angle to the incline on a hand truck caring six 15 kg boxes. If the incline is 30° at the cart accelerates at $3m/s^2$ down the inline, how much force does the person pull with to slow it down?



5. A person pushes a 45 kg motorized scooter up a set of ramps into a car. If the ramps make an angle of 15° with the ground and the person pushes with a force at 40° to the incline. What force must the person be pushing at the hold the scooter in equilibrium?



6. A person pushes a gigantic 80kg ball up an incline of 20° . If person is pushing up on the object at 10° , what force is required to make the ball accelerate at 0.25m/s^2 .

