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1. A car with a mass of 525 kg is being pushed west (left) by a force of 375 N from its engine. The coefficient of friction felt by the car is .0420 .
A) Calculate the force weight of the car.
B) Calculate the force friction acting on the car.
C) What is the net force acting on this car?
D) Calculate the acceleration of the car.
2. A fully loaded Saturn V rocket has a mass of $2.92 \times 10^{6} \mathrm{~kg}$. Its engines have a continual upward thrust of $3.34 \times 10^{7} \mathrm{~N}$.
A) Calculate the downward force, caused by gravity, on the rocket at blastoff.
B) What is the net force acting on the rocket at blastoff?
C) Calculate the acceleration of the rocket as it leaves the launch pad.
D) As the rocket travels upwards, the engine thrust remains constant, but the mass of the rocket decreases. Why?
E) Does the acceleration of the rocket increase, decrease, or remain the same as the engines continue to fire? Explain your answer using Newton's laws.
3. A 438 kg car is accelerating east at $2.55 \mathrm{~m} / \mathrm{s}^{2}$. If the coefficient of friction felt by the car is 0.500 ; what is the total force acting east on the car? (Hint: four calculations needed!)
