A father ($m_1 = 70\text{kg}$) and his son ($m_2 = 35\text{kg}$) are standing on the ice in the middle of a pond. The coefficient of static friction between boots and ice is the same for both persons. Who will win the race (from rest) to the edge of the pond?

(a) if both runners move as fast as possible without slipping,

(b) if each runner drags a sled ($m_s = 10\text{kg}$) by a cord, where the frictional force acting on the sled is negligibly small?

Justify your answers carefully.

Solution: