A 6kg cart on a level surgacr is pulled at a constant velocity of 2m/s by a constant force of 10 N. What is the acceleration? What is the friction force opposing the motion?

Acceleration by definition equals:

$$a = \frac{dv}{dt}$$

if cart is pulled at a constant velocity $v = const$, then $\frac{dv}{dt} = 0$ and

$$a = 0$$

Newton's first law of motion: if $a = 0 => \sum \vec{F_i} = 0$, therefore $\vec{F} + \overrightarrow{F_{fr}} = 0$.

The force of friction directed opposite to motion, so $F - F_{fr} = 0$

$$F_{fr} = F = 10\ N$$

Answer: $a = 0$, $F_{fr} = 10\ N$