1. If a car can accelerate at 4m/sec2, what acceleration can it attain if it is pulling another car of identical mass?

$a = 4\frac{m}{s^2}$	*Solution.*
$a_1 - ?$	Let write the second Newton law in projections on *X*-axis, assuming a car moves along a horizontal road: $$ma = F - \mu N,$$

where F is the puling force of the engine, μN is the friction force (μ is the friction coefficient). The normal force can be found, noting that it is compensated by the gravity force: $N = mg$.

So, the acceleration is

$$a = \frac{F}{m} - \mu g \ .$$

If the car pulls another car of identical mass, that the second Newton for these cars law must be written as

$$\begin{cases} ma_1 = F - \mu N - T \\ ma_1 = T - \mu N \end{cases},$$

where T is the tension force of the rope and $N = mg$ for each car.

As one can solve, the resulting acceleration becomes $a_1 = \frac{F}{2m} - \mu g$. So, $\boxed{a_1 = a - \frac{F}{2m}}$

This acceleration depends on the puling force of the engine and the mass of a car.

Answer: $a_1 = a - \frac{F}{2m}$,

where F is the puling force of the engine and $a_1 = a - \frac{F}{2m}$ is the mass of a car.