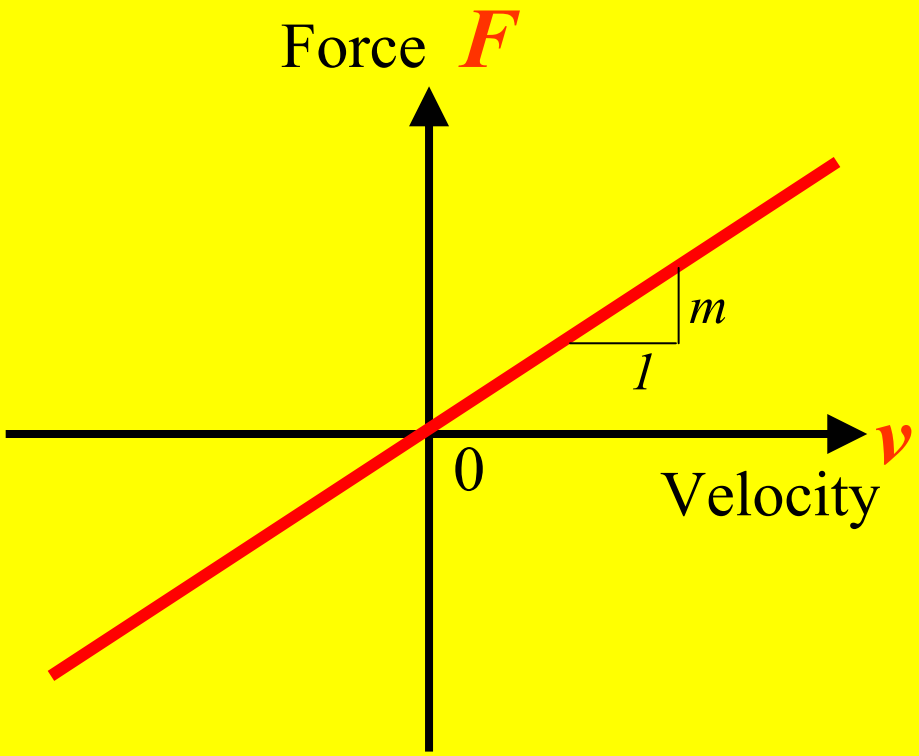
Aristotle's Law of Motion

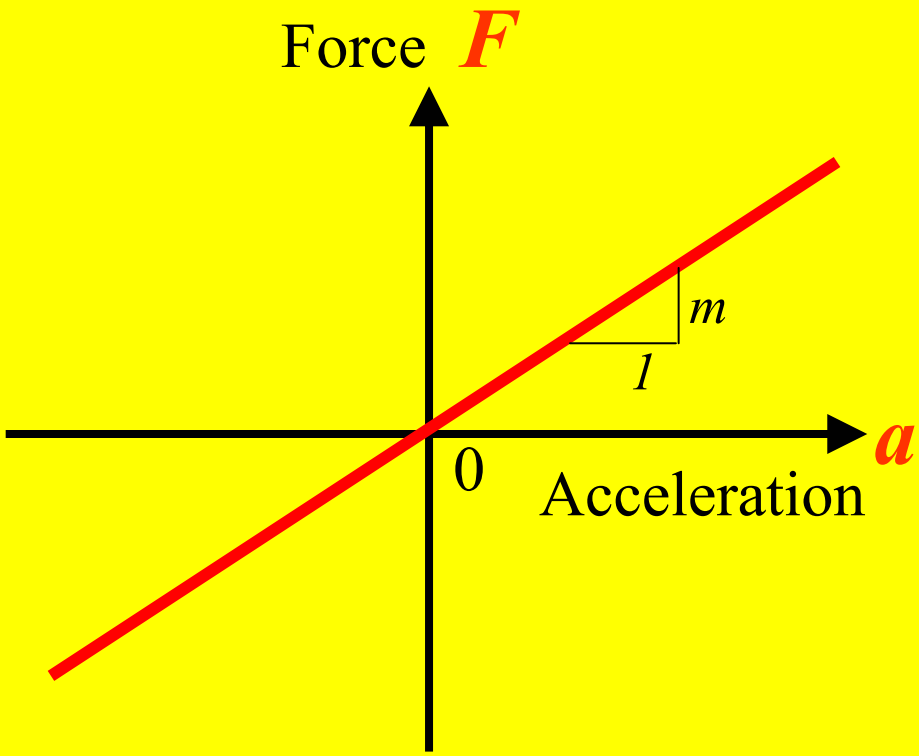
Force *F* acting on a body is proportional to its velocity *v* of motion;

$$F = mv$$

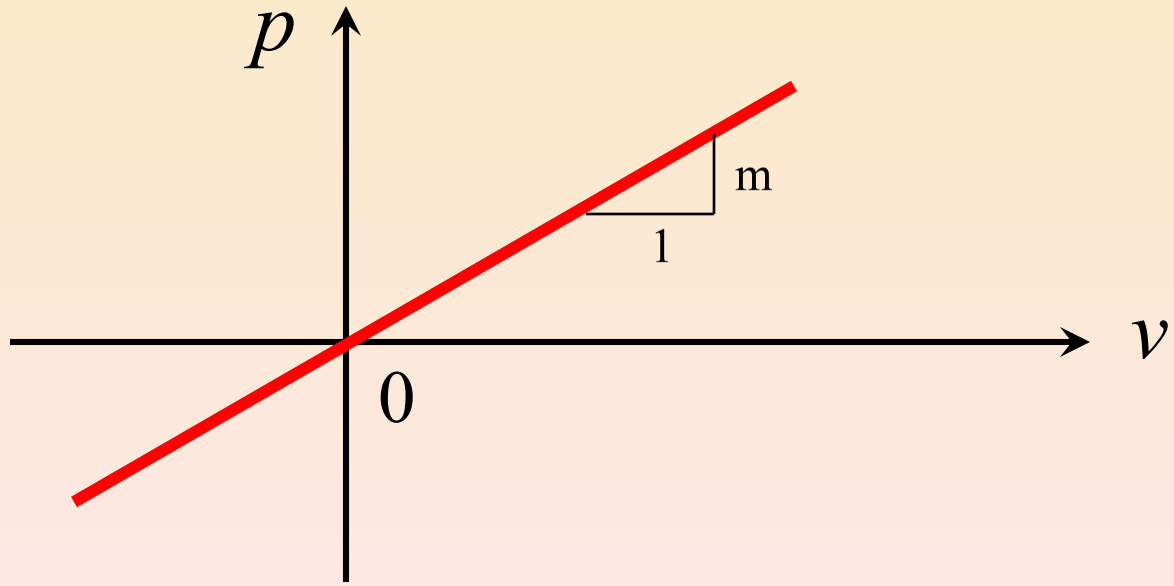


Newton's Second Law

$$F = ma$$



Corrected Newton's Second Law of Motion



$$p = m\,v$$

$$f = \frac{dp}{dt}$$

where p = momentum
v = velocity
f = force

Einstein's Relativistic Law of Motion

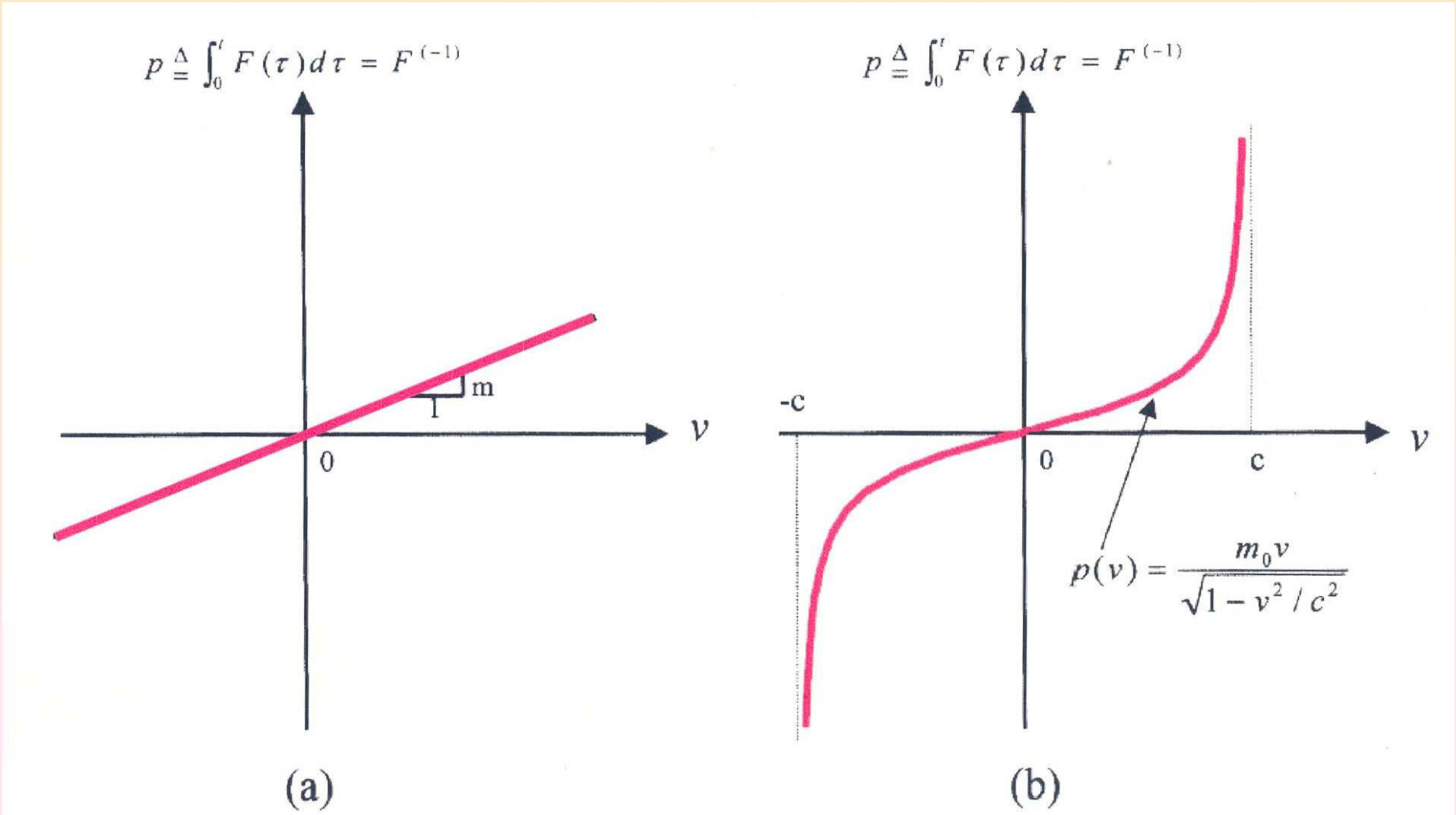
$$p = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$f = \frac{dp}{dt}$$

where

p = momentum

f = force


$p \triangleq \int_0^t F(\tau)d\tau = F^{(-1)}$
m
1
0
v
(a)
$p \triangleq \int_0^t F(\tau)d\tau = F^{(-1)}$
-c
0
c
v
$p(v) = \frac{m_0 v}{\sqrt{1 - v^2/c^2}}$
(b)

Aristotle's mechanics survived for thousands of years until they were displaced by **Newton's**. **Newton's theories of motion** lasted hundreds of years until they were displaced by Einstein's. We've lived with **general relativity** for less than a century.