

Personal knowledge library

Mikael B. Kiste

12. mai 2017

Innhold

1	Physics	2
1.1	Constant translational acceleration in a straight line	2
1.2	Moore's law	2
1.3	Escape velocity	2
1.4	Relativity	2
1.4.1	Photons	2
2	Mathematics	3
2.1	Complex numbers	3

1 Physics

1.1 Constant translational acceleration in a straight line

$$v(t) = \int a \, dt = at + v_0 \quad (1)$$

$$s(t) = \int v \, dt = \frac{1}{2}at^2 + v_0t + s_0 \quad (2)$$

$$(3)$$

1.2 Moores law

The observation that the number of transistors in a dense integrated circuit doubles approximately every two years

1.3 Escape velocity

$$-E_k = E_p \quad (4)$$

$$-\frac{1}{2}mv^2 = \int_{r_0}^{\infty} -G \frac{Mm}{r^2} \, dr \quad (5)$$

$$-\frac{1}{2}mv^2 = G \frac{Mm}{r} \Big|_{r_0}^{\infty} \quad (6)$$

$$-\frac{1}{2}mv^2 = -G \frac{Mm}{r_0} \quad (7)$$

$$v = \sqrt{2 \frac{M}{r_0}} \quad (8)$$

1.4 Relativity

$$E^2 = (m_0c^2)^2 + (pc)^2 \quad (9)$$

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} \quad (10)$$

1.4.1 Photons

$$m_0 = 0 \quad (11)$$

$$E = pc = h\nu \quad (12)$$

2 Mathematics

2.1 Complex numbers

$$\mathbb{C}\bar{\mathbb{C}} = (a + ib)(a - ib) = a^2 + b^2 = \left(\sqrt{a^2 + b^2}\right)^2 = |\mathbb{C}|^2 \quad (13)$$