

3. The acceleration of a particle is directly proportional to the time  $t$ . At  $t=0$ , the velocity of a particle = -12 m/s. Knowing that  $v=0$  and  $x = 15$  when  $t=4s$ , write the equation of the motion.

$$a(t)=Ct$$

$$v(0)=-12$$

$$v(4)=0$$

$$x(4)=15$$

$$v(t) = \int C t dt$$

$$v(t) = \frac{1}{2} C * t^2 + B$$

$$v(0)=-12$$

$$v(4)=0$$

$$B=-12$$

$$C=1,5$$

$$v(t) = \frac{3}{4} t^2 - 12 = \frac{3}{4} (t^2 - 16)$$

$$x(t) = \int \frac{3}{4} (t^2 - 16) = \frac{3}{4} (\frac{1}{3} t^3 - 16x) = \frac{1}{4} t^3 - 12x + D$$

$$x(t) = \frac{1}{4} t^3 - 12x + D$$

żeby wyliczyć  $D$ , podstawiamy  $x(4)=15$

$$D=47$$

Ostateczna odpowiedź:

$$x(t) = \frac{1}{4} t^3 - 12x + 47$$