

MOTO ARMONICO

Equazioni del moto armonico:

$$x(t) = A \cos(\omega t + \theta_0)$$

$$v(t) = -\omega A \sin(\omega t + \theta_0)$$

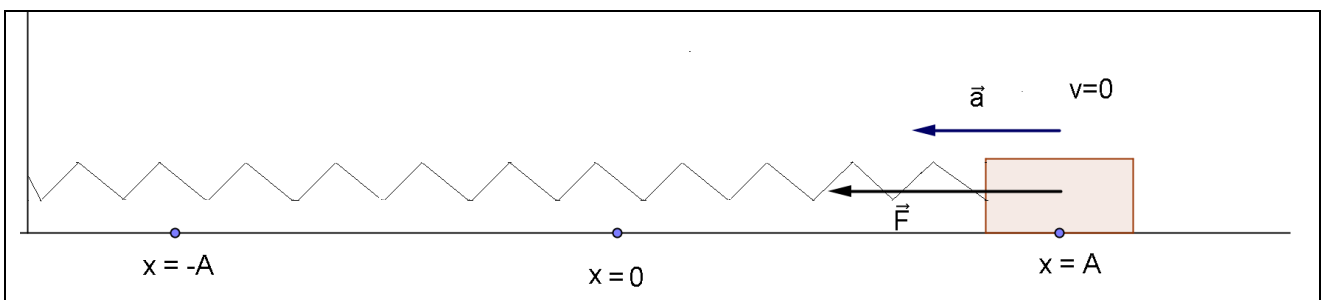
$$a(t) = -\omega^2 A \cos(\omega t + \theta_0)$$

$$\omega = \sqrt{\frac{k}{m}} \quad T = \frac{2\pi}{\omega}$$

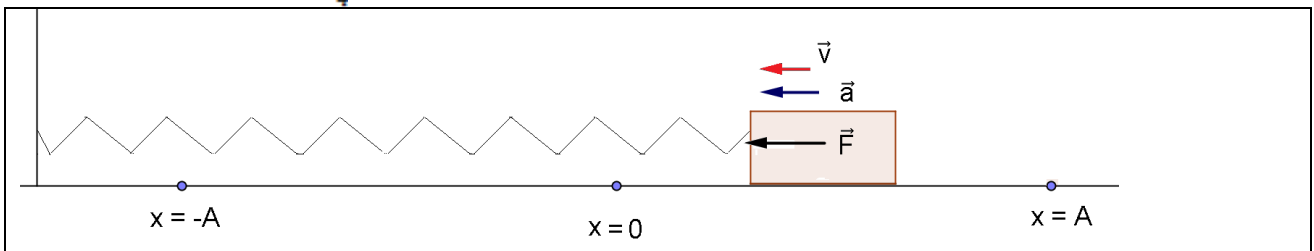
Nell'esempio che segue poniamo $\theta_0 = 0$, in modo che l'equazione oraria diventi $x(t) = A \cos(\omega t)$.

In questo caso per $t=0$ l'oscillatore si trova in A

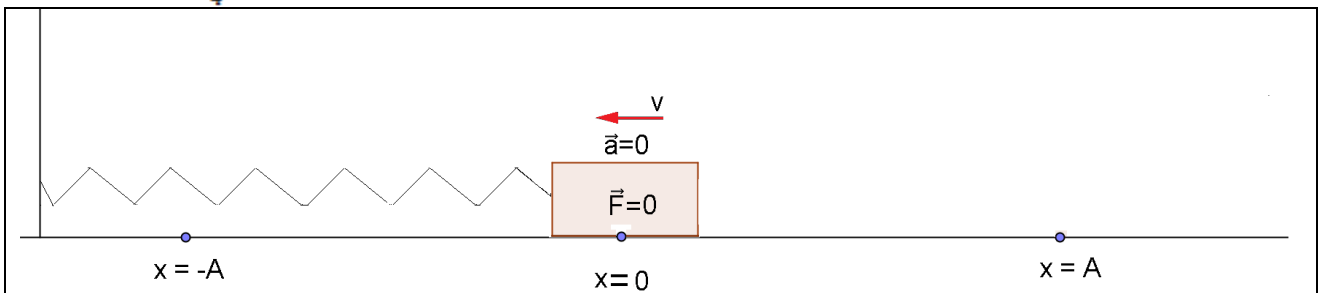
1. $x = A \quad t = 0$



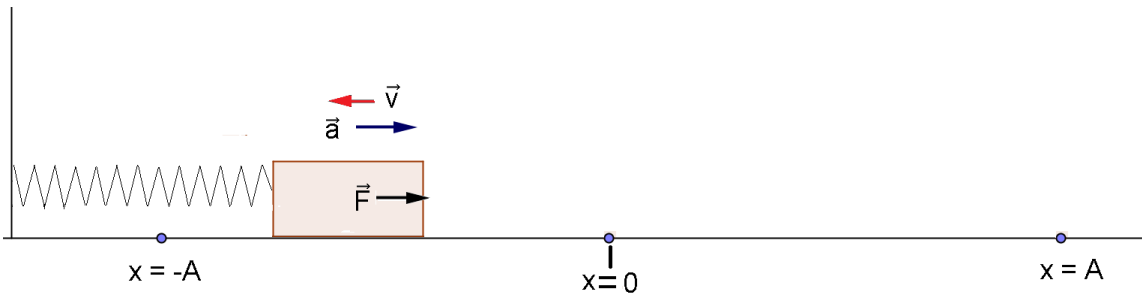
2. $0 < x < A \quad 0 < t < \frac{T}{4}$



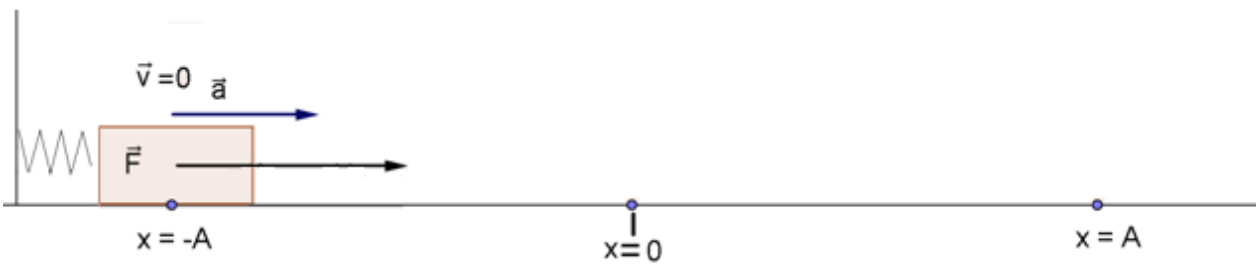
3. $x = 0 \quad t = \frac{T}{4}$



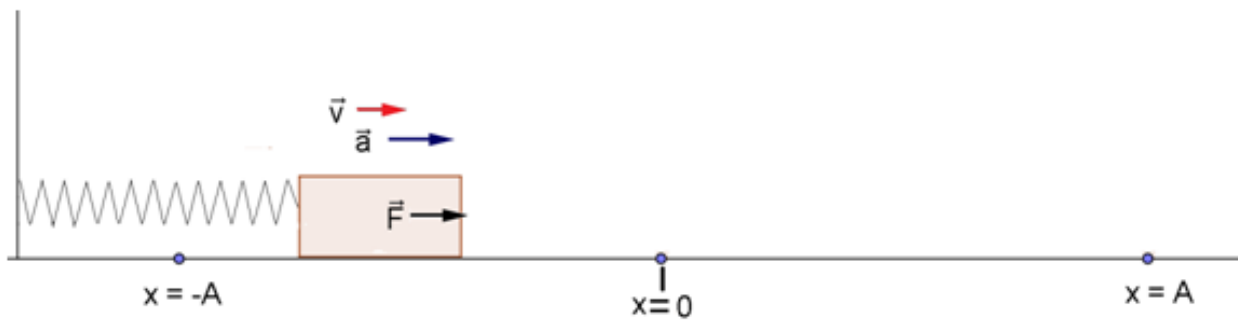
4. $-A < x < 0 \quad 0 < t < \frac{T}{2}$



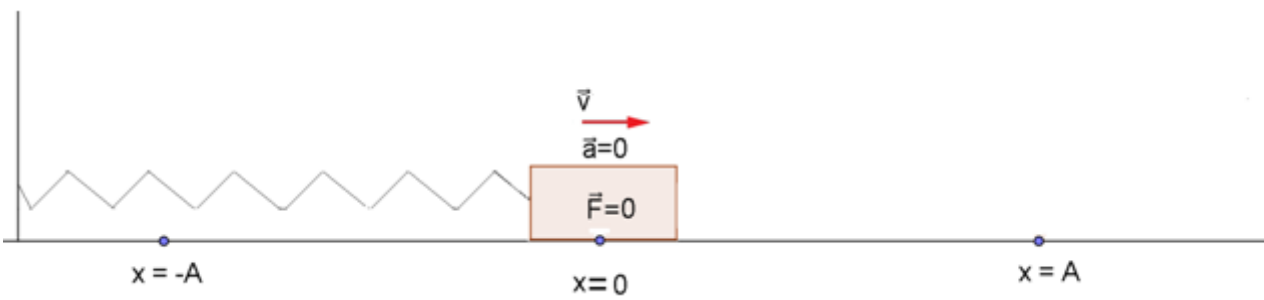
5. $x = -A \quad t = \frac{T}{2}$



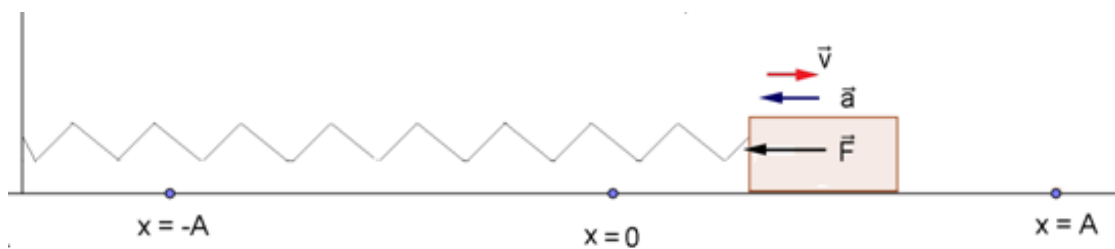
6. $-A < x < 0 \quad \frac{T}{2} < t < \frac{3T}{4}$



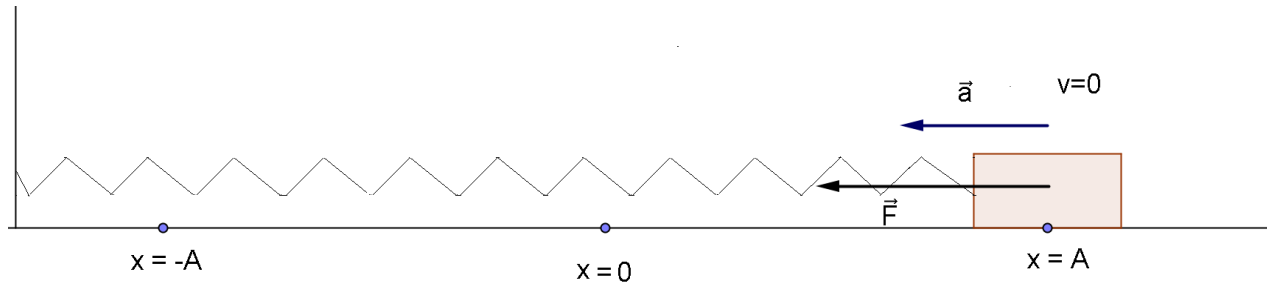
7. $x = 0 \quad t = \frac{3T}{4}$



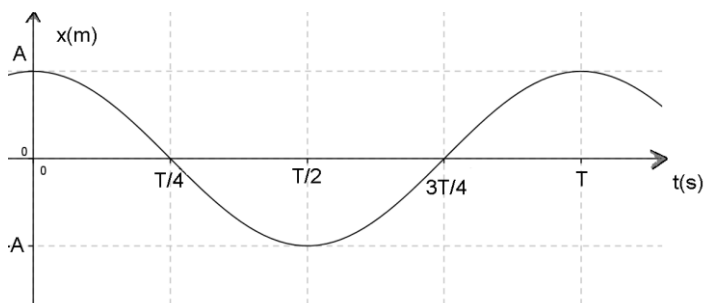
8. $0 < x < A \quad \frac{3}{4}T < t < T$



9. $x = A \quad t = T$

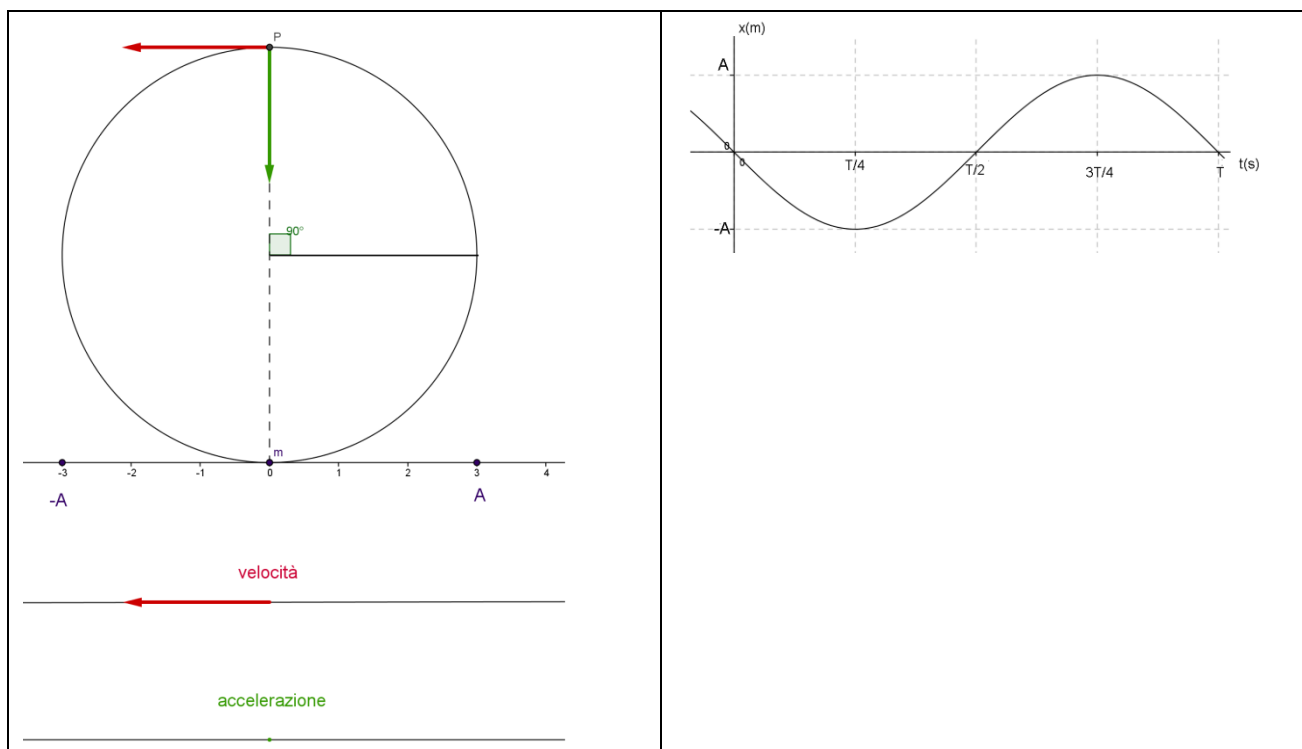


Il grafico posizione tempo è questo.



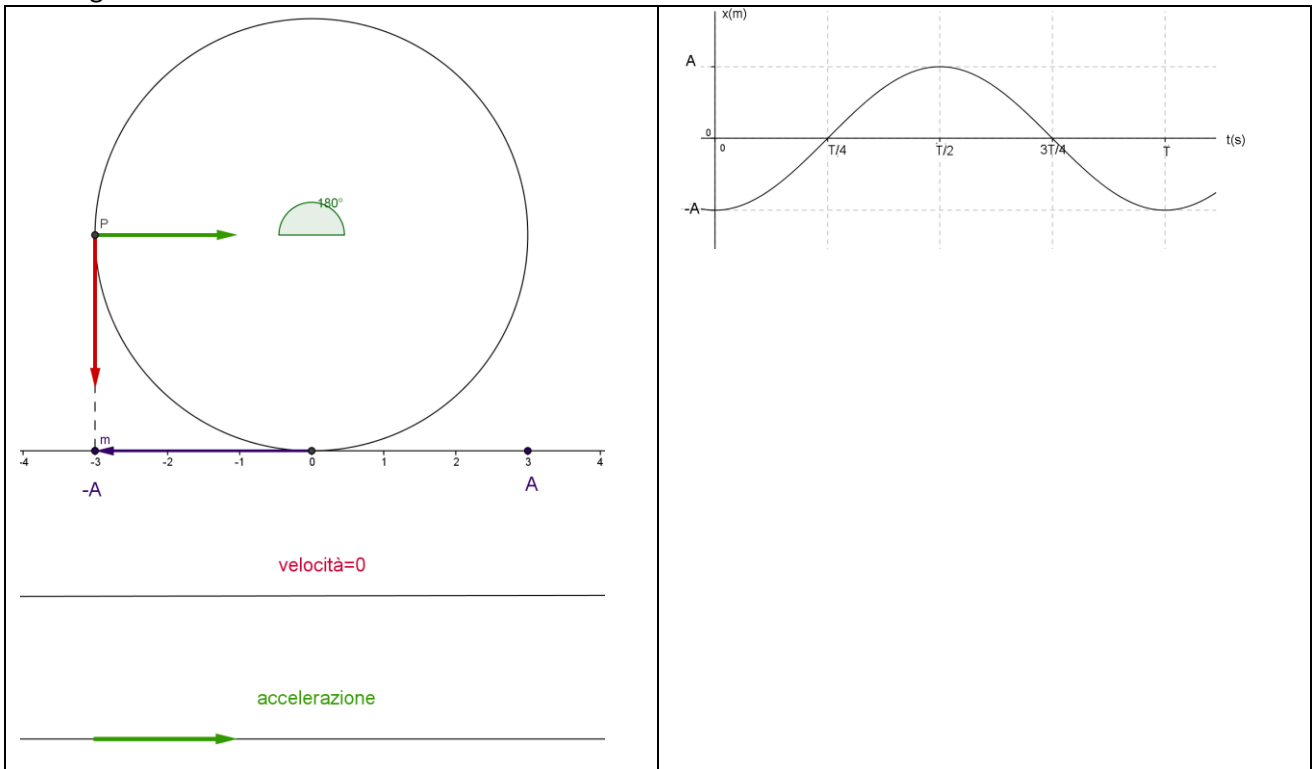
Se $\theta_0 = \frac{\pi}{2}$ l'equazione oraria diventa $x(t) = A \cos(\omega t + \frac{\pi}{2})$

Il suo grafico diventa:



Se $\theta_0 = \pi$ l'equazione oraria diventa $x(t) = A\cos(\omega t + \pi)$

Il suo grafico diventa:



Se $\theta_0 = \frac{3\pi}{2}$ l'equazione oraria diventa $x(t) = A\cos(\omega t + \frac{3}{2}\pi) = A\sin(\omega t)$

Il suo grafico diventa:

