27.10.2017 formulas, physics:

Friction changes the experimental results significantly.

Machines must be used in the experiments to reduce human error.

Video cameras must be used in the experiments to reduce human error.

Averaging many experiments reduces random error.

Relative error must be about the same for all measurements.

ddu = neutron (quarks, nuclear physics)

uud = proton (quarks, nuclear physics)

λD = ax Young double-slit experiment (waves)

d sinA = nλ diffraction grating (waves)

$y=A\sin(\left(ω\left(t - \frac{x}{v}\right)\right)),$ ω = 2πf, $f= \frac{1}{T} $(waves)

$y\_{1}+ y\_{2}=2A\cos(\left(\frac{ωx}{v}\right))\sin(\left(ωt\right))$ standing waves.

For R = r power loss is maximum (electrical circuits)

$R=\frac{ρL}{A}$ (resistance, resistivity (electricity))

Ed = V (uniform field strength (electric field))

F = Eq (field and force (electricity))

$qV= \frac{mv^{2}}{2}$ (charge, Voltage, mass, velocity, electricity, mechanics)

p = gh (pressure, fluid mechanics)

$F=CρAv^{2}$ (resistance force (fluid mechanics))

**M = D×F** ((cross-product) moment of force, mechanics)

W = FD ((dot-product) work = Force Distance (mechanics))

Ft = mv (mechanics)

P = $\frac{W}{t}=\frac{dW}{dt}$ = Fv (power, work, force, velocity, mechanics)

$c=\frac{m\_{1}x\_{1}+m\_{2}x\_{2}}{m\_{1}+m\_{2}}$ (center of mass (solid mechanics))

Center of gravity is the center of parallel forces, moment = 0.

F = ma (Newton Second Law (material point, solid mechanics))

M = Jε , J = R2 moment of inertia (rotation (solid mechanics))

σ = Eε (Hooks Law (deformed mechanics))

$T=2π\sqrt{\frac{L}{g}}$ (pendulum harmonic oscillator period (solid mechanics))

$T=2π\sqrt{\frac{m}{k}}$ (spring harmonic oscillator period (solid mechanics))

$T=2π\sqrt{\frac{J}{c}}$ (rotational harmonic oscillator period (solid mechanics))

$T=2π\sqrt{LC}$ (LC circuit harmonic oscillator period (electricity))