Required Knowledge

What You Should Know To Get A Smooth Start

- Solid algebra, Trigonometry.
- Arithmetic and geometric series formulas:
  $1 + 2 + 3 + \ldots + n = n(n+1)/2$ and
  $1 + q + q^2 + q^3 + \ldots + q^n + \ldots = \dfrac{1}{1-q}$
- Ellipsis equation $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1.$
- Exponential function and its main properties
  $e^{x+y} = e^x e^y$, $e^x \approx (1 + x/N)^N$, $N \gg 1$

8-11 grades. More than enough.

Required Knowledge

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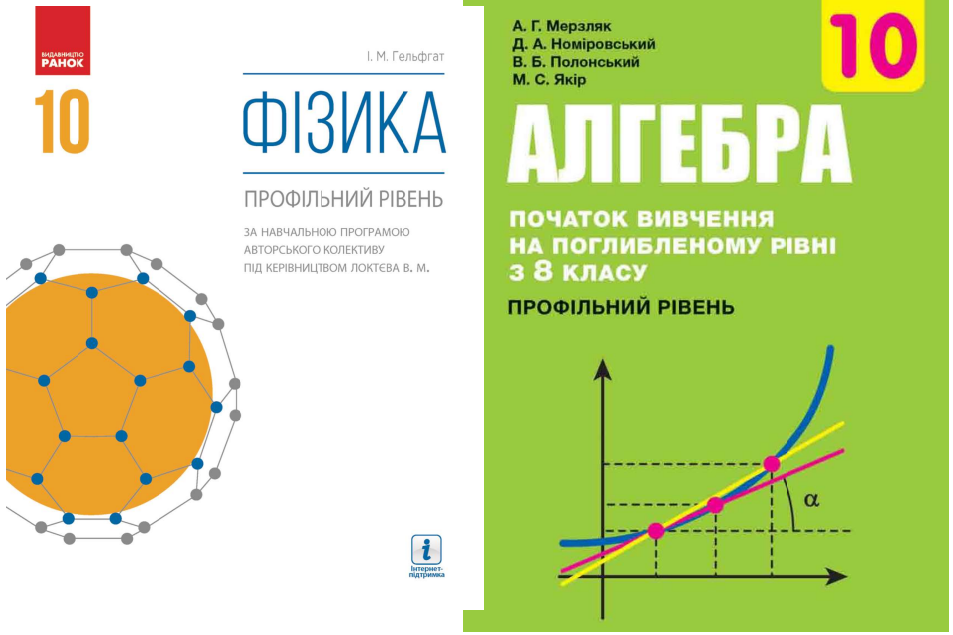
- Newton's second law $F = ma$
- Momentum $p = mv$ and kinetic energy $E_k = \frac{mv^2}{2}$.
- Hooke's law $F = kx$ and potential energy of a stretched spring $E_p = \frac{kx^2}{2}$.
- Newton's law of universal gravitation $F = G\frac{Mm}{r^2}$ and Coulomb's law $F = k\frac{Qq}{r^2}$.
- Conservation of energy.
- Waves and their basic properties.



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