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Nota di contenuto	Preface; Contents; 1. Ground State Energy of a Hybrid Harmonic-Quartic Oscillator: A Case Study; 1.1 Solved problems; 1.1.1 Dimensional analysis and why it fails in this case; 1.1.1.1 Side comment: dimensional analysis and approximations; 1.1.1.2 Side comment: how to recast input equations in a dimensionless form; 1.1.2 Dimensional analysis: the harmonic oscillator alone; 1.1.3 Order-of-magnitude estimate: full solution; 1.1.3.1 Order-of-magnitude estimates vis-a-vis dimensional analysis; 1.1.3.2 Harmonic vs. quartic regimes; 1.1.3.3 The harmonic oscillator alone 1.1.3.4 The quartic oscillator alone1.1.3.5 The boundary between the regimes and the final result; 1.1.4 An afterthought: boundary between regimes from dimensional considerations; 1.1.5 A Gaussian variational solution; 2. Bohr-Sommerfeld Quantization; 2.1 Solved problems; 2.1.1 A semi-classical analysis of the spectrum of a harmonic oscillator: the exact solution, an order-of-magnitude estimate, and dimensional analysis; 2.1.2 WKB treatment of a "straightened" harmonic oscillator; 2.1.3 Ground state energy in power-law potentials; 2.1.4 Spectrum of power-law potentials 2.1.5 The number of bound states of a diatomic molecule2.1.6 Coulomb problem at zero angular momentum; 2.1.7 Quantization of

angular momentum from WKB; 2.1.8 From WKB quantization of 4D angular momentum to quantization of the Coulomb problem; 2.2 Problems without provided solutions; 2.2.1 Size of a neutral meson in Schwinger's toy model of quark confinement; 2.2.2 Bohr-Sommerfeld quantization for periodic boundary conditions; 2.2.3 Ground state energy of multi-dimensional powerlaw potentials; 2.2.4 Ground state energy of a logarithmic potential; 2.2.5 Spectrum of a logarithmic potential
2.2.6 1D box as a limit of power-law potentials2.2.7 Spin-1/2 in the field of a wire; 2.2.8 Dimensional analysis of the time-dependent Schro-dinger equation for a hybrid harmonicquartic oscillator; 2.3 Background; 2.3.1 Bohr-Sommerfeld quantization; 2.3.2 Multi-dimensional WKB; 2.4 Problems linked to the "Background"; 2.4.1 Bohr-Sommerfeld quantization for one soft turning point and a hard wall; 2.4.2 Bohr-Sommerfeld quantization for two hard walls; 3. "Halved" Harmonic Oscillator: A Case Study; Introduction; 3.1 Solved Problems; 3.1.1 Dimensional analysis; 3.1.2 Order-of-magnitude estimate
3.1.3 Another order-of-magnitude estimate3.1.4 Straightforward WKB; 3.1.5 Exact solution; 4. Semi-Classical Matrix Elements of Observables and Perturbation Theory; 4.1 Solved problems; 4.1.1 Quantum expectation value of x6 in a harmonic oscillator; 4.1.2 Expectation value of r2 for a circular Coulomb orbit; 4.1.3 WKB approximation for some integrals involving spherical harmonics; 4.1.4 Ground state wave function of a one dimensional box; 4.1.5 Eigenstates of the harmonic oscillator at the origin: how a factor of two can restore a quantum-classical correspondence
4.1.6 Probability density distribution in a "straightened" harmonic oscillator

Sommario/riassunto

Dimensional and order-of-magnitude estimates are practiced by almost everybody but taught almost nowhere. When physics students engage in their first theoretical research project, they soon learn that exactly solvable problems belong only to textbooks, that numerical models are long and resource consuming, and that ""something else"" is needed to quickly gain insight into the system they are going to study. Qualitative methods are this ""something else"", but typically, students have never heard of them before. The aim of this book is to teach the craft of qualitative analysis using a set of p

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Sommario/riassunto	"Floppy Logic is an exploration into the 'architecture' of fashion and textiles, and how the concepts, aesthetics, techniques and construction of this architecture might be understood and used to design and fabricate objects and space differentially. This book explores these territories through physical and digital testing of ideas that begin at the scale of papers and end at the scale of buildings"--Page 4 of cover.