- Preface p. vii
- 1 Basic Formulas p. 1
- Pressure Gradient p. 1
- Hydrostatic pressure p. 3
- Converting Pressure into Mud Weight p. 4
- Specific Gravity p. 5
- Equivalent Circulating Density p. 6
- Maximum Allowable Mud Weight p. 7
- Pump Output p. 7
- Annular Velocity p. 9
- Capacity Formulas p. 12
- Control Drilling p. 19
- Buoyancy Factor p. 20
- Hydrostatic Pressure Decrease When Pulling Pipe out of the Hole p. 20
- Loss of Overbalance Due to Falling Mud Level p. 22
- Formation Temperature p. 24
- Hydraulic Horsepower p. 25
- Drill Pipe/Drill Collar Calculations p. 25
- Pump Pressure/Pump Stroke Relationship p. 27
- Cost per Foot p. 28
- Temperature Conversion Formulas p. 29
- 2 Basic Calculations p. 31
- Volumes and Strokes p. 31
- Slug Calculations p. 33
- Accumulator Capacity p. 37
- Bulk Density of Cuttings p. 41
- Drill String Design (Limitations) p. 42
- Ton-Mile Calculations p. 44
- Cementing Calculations p. 47
- Weighted Cement Calculations p. 53
- Calculations for the Number of Sacks of Cement Required p. 54
- Calculations for the Number of Feet to Be Cemented p. 57
- Setting a Balanced Cement Plug p. 61
- Differential Hydrostatic Pressure Between Cement in the Annulus and Mud Inside the Casing p. 65
- Hydraulicing Casing p. 66
- Depth of a Washout p. 70
- Lost Returns--Loss of Overbalance p. 71
- Stuck Pipe Calculations p. 72
- Calculations Required for Spotting Pills p. 75
- Pressure Required to Break Circulation p. 79
- 3 Drilling Fluids p. 81
- Increase Mud Density p. 81
- Dilution p. 85
- Mixing Fluids of Different Densities p. 86
- Oil-Based Mud Calculations p. 87

- Solids Analysis p. 91
- Solids Fractions p. 95
- Dilution of Mud System p. 96
- Displacement--Barrels of Water/Slurry Required p. 97
- Evaluation of Hydrocyclone p. 97
- Evaluation of Centrifuge p. 99
- 4 Pressure Control p. 103
- Kill Sheets and Related Calculations p. 103
- Prerecorded Information p. 115
- Kick Analysis p. 124
- Pressure Analysis p. 137
- Stripping/Snubbing Calculations p. 139
- Subsea Considerations p. 144
- Workover Operations p. 153
- Controlling Gas Migration p. 157
- Gas Lubrication p. 159
- Annular Stripping Procedures p. 161
- 5 Engineering Calculations p. 165
- Bit Nozzle Selection--Optimized Hydraulics p. 165
- Hydraulics Analysis p. 169
- Critical Annular Velocity and Critical Flow Rate p. 173
- "d" Exponent p. 174
- Cuttings Slip Velocity p. 175
- Surge and Swab Pressures p. 179
- Equivalent Circulation Density p. 187
- Fracture Gradient Determination--Surface Application p. 190
- Fracture Gradient Determination--Subsea Application p. 194
- Directional Drilling Calculations p. 197
- Miscellaneous Equations and Calculations p. 203
- Appendix A p. 209
- Appendix B p. 217
- Index p. 221