Mathematical Understandings

Conceptual Understanding

"Conceptual understanding: comprehension of mathematical concepts, operations, and relations." (Adding It Up, p. 116)

"Conceptual understanding refers to an integrated and functional grasp of mathematical ideas." (Adding It Up, p. 118)

"These Standards endeavor to stress... conceptual understanding of key ideas [and] continually return to organizing principles to structure those ideas." (Common Core State Standards for Mathematics, p. 4.)

Procedural Fluency

"Procedural fluency refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently." (Adding It Up, p. 221.)

Mathematical Reasoning/Problem Solving

Mathematical Reasoning:
“Standards for Mathematical Practice 2. Reason abstractly and quantitatively. 
...Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.” (Common Core State Standards for Mathematics, p. 6.)

“Adaptive Reasoning: Capacity for logical thought, reflection, explanation, and justification.” (Adding It Up, p. 116.)

Problem Solving:
“...engage[e] in a task for which the solution method is not known in advance.” (NCTM Principles and Standards for School Mathematics, 2000, p. 52, quoted in the edTPA Glossary.)

“Standards for Mathematical Practice 1. Make sense of problems and persevere in solving them. 
...Students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. ...Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem.” (Common Core State Standards for Mathematics, p. 6.)

“Strategic Competence: Ability to formulate, represent, and solve mathematical problems.” (Adding It Up, p. 116.)