Mathematical Point Examples and Non-Examples

Mathematical Point ~ The mathematical understanding (well-specified statement of a mathematical truth) that (1) students could gain from considering a particular instance of student thinking; and (2) is most closely related to the student mathematics of the thinking.

Context	Student Mathematics (SM)	Well-Specified Statement of a Mathematical Truth			Not Well-Specified
		Could be gained from considering SM		Could not be gained from considering SM	
		Mathematical Point	Not Closest to SM		
In an algebra lesson on solving linear equations, the class is discussing how to solve for m in the equation $m - 12 = 5$ and a student responds, "Subtract 12 from both sides."	To solve for m in the equation $m - 12 = 5$, subtract 12 from both sides of the equation.	Any term can be removed from one side of an equation by adding its additive inverse to both sides of the equation.	Adding a number and subtracting that same number are inverse operations.	An integer and its opposite are the same distance from zero on the number line. (Charles, 2005, p. 18)	Solving linear equations.
In a beginning algebra lesson on representing linear situations with equations, the equation (t*2.5)+25 = m is on the board. A student says, "you don't need the parentheses."	In the equation (t*2.5)+25 = m, the parentheses around t*2.5 are optional.	Parentheses are necessary when the intended order of operations differs from the conventional order of operations.	The commutative property applies to addition and multiplication but not subtraction and division. (Charles, 2005, p. 16)	The nature of the quantities in a relationship determines what values of the input and output quantities are reasonable. (Charles, 2005, p. 18)	Order of operations.
In an introductory lesson on adding fractions with like denominators, a student writes 2/5 + 1/5 = 3/10 on the board.	2/5 + 1/5 = 3/10.	Adding fractional pieces of the same size changes the number of pieces, but not the size of the pieces.	Adding two quantities means combining the amounts together.	Every fraction/ratio can be represented by an infinite set of different but equivalent fractions/ratios. (Charles, 2005, p. 18)	How to get a common denominator when adding fractions.
On day two of a unit on solving simple linear equations, the teacher writes x = 3 as the solution to $x + 2 = 5$, and a student remarks, "Hey, wait a minute, yesterday you said x equals two!"	Yesterday x equaled 2 and today x equals 3.	A letter can be used to represent an unknown quantity in an equation and can represent different quantities for different equations.	Letters can be used to represent unknown quantities, varying quantities, and arguments for a function.	Any term can be removed from one side of an equation by adding its additive inverse to both sides of the equation.	The meaning of variable.