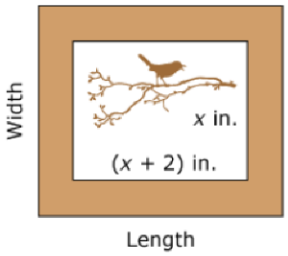
Sample Mathematics Item: Algebra I/Mathematics II

"Picture Frame"

November 2013

Sam uses one-inch frames for pictures for which the length is 2 inches (in.) longer than the width, as shown.



The area of the frame for a picture that is x inches wide is given by the expression:

$$(x+4)(x+2)-(x+2)x$$

There are four descriptions shown. Drag the correct expression to the appropriate box below the corresponding description.

x $\quad$ $(x+2)$ $\quad$ $(x+4)$

$(x+2)x$ $\quad$ $(x+4)(x+2)$

the length of the picture alone, in inches	the length of the frame, in inches	the area of the picture alone, in square inches	the area of the picture and frame together, in square inches

Click on a choice and drag it to a box.

HS	Picture Frame
Type	Type I 2 Points
Evidence Statement	**A-SSE.1-2:** Interpret quadratic expressions that represent a quantity in terms of its context. a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity
Most Relevant Standards for Mathematical Content	**A-SSE.1:** Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1+r)^n$ *as the product of P and a factor not depending on P.* This standard is major content in the course based on the PARCC Model Content Frameworks.
Most Relevant Standards for Mathematical Practice	This task requires students to make use of the structure provided in the diagram and the formula (MP.7). In addition, students must contextualize that structure to address the descriptions (MP.2).
Item Description and Assessment Qualities	This application task requires students to understand a diagram and formula, and then use expressions within that formula to represent a quantity in terms of its context. The situation allows for possible explanations so students have to carefully attend to the meaning of the variable and the context of the situation. The answer space is technology-enhanced so it can be scored immediately. Unlike traditional multiple choice, it is difficult to guess the correct answer or use a choice elimination strategy.
Scoring Information	The length of the picture alone in inches: $(x+2)$ The length of the frame in inches: $(x+4)$ The area of the picture alone in square inches: $(x+2)x$ The area of the picture and frame together in square inches: $(x+4)(x+2)$ The student must get all 4 parts correct to earn 2 points and 3 parts correct to earn 1 point.