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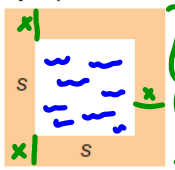
Task #5: Swimming Pool

You want to build a square swimming pool in your backyard. Let s denote the length of each side of the swimming pool (measured in feet). You plan to surround the pool by square border tiles, each of which is one foot by one foot (see figure).



$s+2x$

$A = l \cdot w$

$A = (s+2x)(s+2x) - s \cdot s$ (FOIL)

A teacher asks her students to find an expression for the number of tiles needed to surround such a square pool, and sees the following responses from her students:

$4(s+1) = 4s+4$

s^2 ← Pool Area

$4s+4$

$2s+2(s+2) = 2s+2s+4$

$4s$ ← P of Pool

$4s+4$

$s^2 + 2sx + 2sx + 4x^2 - s^2$

$4sx + 4x^2$

Is each mathematical model correct or incorrect? How do you know?

Progressions for the Common Core State Standards in Mathematics (draft). Grade 6-8, Middle School, Equations and Expressions.

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Task #6: Smartphones

Suppose p and q represent the price (in dollars) of a 64GB and a 32GB smartphone, respectively, where $p > q$. Interpret each of the expressions in terms of money and smartphones. Then, if possible, determine which of the expressions in each pair is larger.

P Q

- p+q and 2q (both phones > 2 of 32GB)
- p+0.08p and q+0.08q (adding tax to price)
- 600-p and 600-q

Task #7: University Population

Let x and y denote the number male and female students, respectively, at a university. where $x < y$. If possible, determine which of the expressions in each pair is larger? Interpret each of the expressions in terms of populations

- x+y and 2y
- $\frac{x}{x+y}$ and $\frac{y}{x+y}$
- $\frac{x-y}{2}$ and $\frac{x}{x+y}$

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