

## *How High Can You Go? Increasing the Cognitive Demand of Mathematics*

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### Expected Outcomes:

- Evaluate high and low level tasks
- Learn how to increase the demand of tasks
- Revise existing tasks to increase cognitive demand

### Guiding Questions:

- How do you choose the problems or tasks that you use with your students: in classroom examples, instruction, assessments, and homework?
- What might be some of the characteristics of the products produced by your students given the tasks you have selected?

### Tasks:

#### **Task A**

$$(3x^2 + 4x - 9) + (9x^2 - 2x)$$

#### **Task B**

$$(-7x^3 + 4x^2 + 3) - \left(\frac{2x^3 - 8x^2 + 4x}{2x}\right)$$

#### **Task C**

What value of **b** would make the following true?

$$\sqrt[b]{x^7 y^{11}} = x^2 y^3 \sqrt[b]{xy^2}$$

#### **Task D**

An auditorium will seat 432 people. Find all possible combinations of rows and number of seats per row. Discuss how you know you found all the combinations. Describe the relationship between rows and number of seats per row.

#### **Task E**

Discuss the relationship between the degree of a polynomial and the number of complex roots? Cite two examples in your discussion.

#### **Task F**

“Anne of Green Gables” was presented by the Virginia drama department last fall. There were 2 types of tickets: Student and Non-student. On Friday, 28 Students and 73 Non-students attended and the box office collected \$479.00. On Saturday, the total collected was \$475.80 when 52 Students and 56 Non-students were in attendance. What was the cost of a Student ticket? Of a Non-student ticket?

### Links:

- VDOE Professional Development SOL Institutes: [http://www.doe.virginia.gov/instruction/mathematics/professional\\_development/index.shtml](http://www.doe.virginia.gov/instruction/mathematics/professional_development/index.shtml)
- Born To Learn Video: [http://www.youtube.com/watch?v=falHoOEUFz0&feature=player\\_detailpage&list=TLzGdoTYEwim6v\\_CP\\_MuSpsaaJQYyhZrUS4](http://www.youtube.com/watch?v=falHoOEUFz0&feature=player_detailpage&list=TLzGdoTYEwim6v_CP_MuSpsaaJQYyhZrUS4)
- Mathematics Assessment Project: <http://map.mathshell.org/materials/tasks.php>
- Illustrative Mathematics: <http://www.illustrativemathematics.org/>
- PALM: <http://palm.sri.com/palm/>
- Inside Mathematics: <http://www.insidemathematics.org/index.php/tools-for-teachers>