Name: **Date:**

UNIT 1 • RELATIONSHIPS BETWEEN QUANTITIES AND EXPRESSIONS
Lesson 1: Working with Radicals and Properties of Real Numbers

Problem-Based Task 1.1.1: Measuring Madness

SMP
1 ✓   2 ✓
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Roxanne wants to display her fancy nested measuring bowls in a line on a shelf. No bowl can be wider than the shelf, and the length of the line must be shorter than the shelf. When full, the bowls can hold 480 cm³, 240 cm³, 120 cm³, 80 cm³, and 60 cm³. The heights of the bowls are 6 cm, 5 cm, 4 cm, 3.5 cm, and 3.5 cm, respectively. The shelf is 45 cm long and 15 cm wide. Roxanne has determined that the diameter of each bowl can be approximated by the formula $d = 2\sqrt{\dfrac{V}{3h}}$, where V represents the volume of the bowl and h represents the height of the bowl. Use the formula to find the diameter of each bowl. Give an exact answer and a decimal approximation for each diameter, and state whether the length of each diameter is rational or irrational. Will the bowls fit on the shelf? Why or why not?

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