

Cara’s Candles Revisited

Mathematical Goals

1. Determine whether a point is a solution to an equation.
2. Determine whether a solution has meaning in a real-world context.
3. Interpret whether the solution is viable from a given model.
4. Write and graph equations and inequalities representing constraints in contextual situations.

Standards for Mathematical Practice

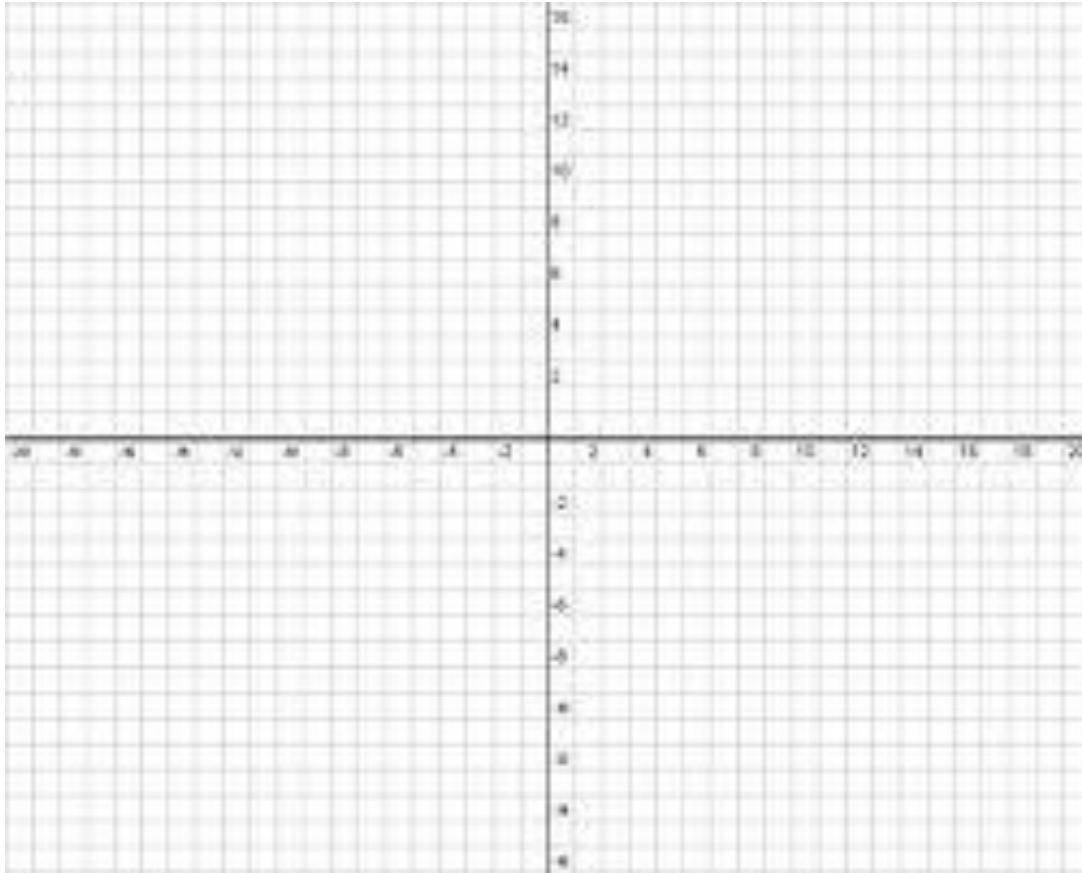
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Cara likes candles. She also likes mathematics and was thinking about using algebra to answer a question that she had about two of her candles. Her taller candle is 16 centimeters tall. Each hour it burns makes the candle lose 2.5 centimeters in height. Her short candle is 12 centimeters tall and loses 1.5 centimeters in height for each hour that it burns.

Cara started filling out the following table to help determine whether these two candles would ever reach the same height at the same time if allowed to burn the same length of time. Finish the table for Cara.

Time (hours)	16 cm candle height (cm)	12 cm candle height (cm)
0	16	12
1	13.5	10.5
2		
3		
4		
5		
6		
7		

1. Use the data in the table to determine what time the two candles will be at the same height. What is the time? What is the height?
2. Using the data from the table, create a graphical representation of the situation. Color the line representing the first candle red and color the line representing the second candle blue.



3. Using the data from the table or the graph, describe any restrictions that might occur.
4. Cara has another candle that is 15 cm tall. How fast must it burn in order to be 6 cm tall after 4 hours? Explain your thinking.

5. What is the equation of this line? Graph the equation on the coordinate plane and color it green.

6. If Cara has another candle that burns 3 cm every hour, how tall would it need to be to reach the same height as the candles represented with the red, blue and green lines after 4 hours? Write an equation of the line that represents this situation. Graph the line on the coordinate plane. Explain your thinking