Accurate Representations

Let's represent situations precisely.

7.1 Possible Rectangles

A rectangle has a perimeter of 40 centimeters.

Here are some lengths in centimeters. Decide if each one *could be* a length of this rectangle. Be prepared to explain your reasoning.

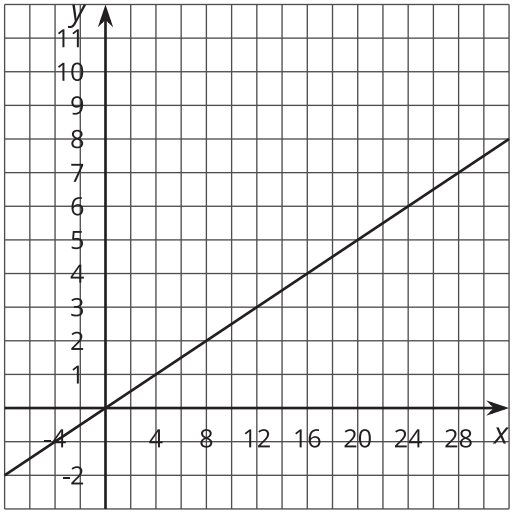
1. 10
2. 4.5
3. 20
4. 32
5. -10
6. 0
7. $\frac{21}{4}$

7.2 Which Graph Represents It the Best?

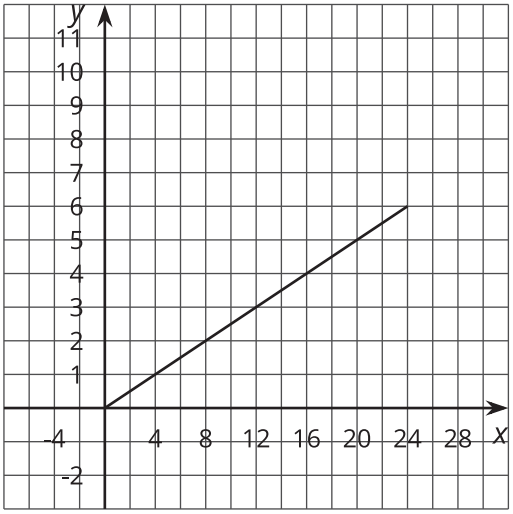
For each situation, several graphs are given. Which graph represents the situation the best? Be prepared to explain your reasoning.

1. The fine for an overdue book at the library is \$0.25 per day, up to a maximum of \$6. x represents time in days, and y represents the fine in dollars.

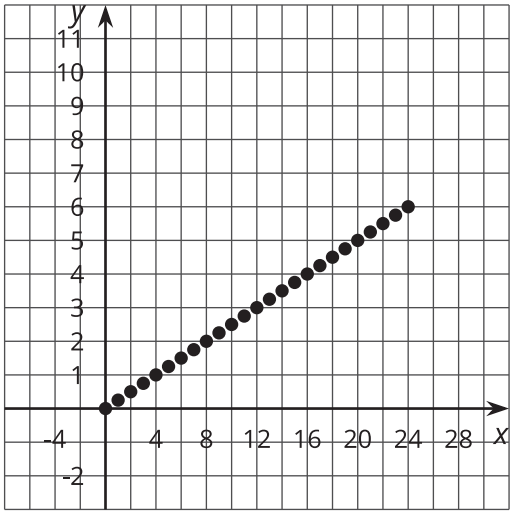
A



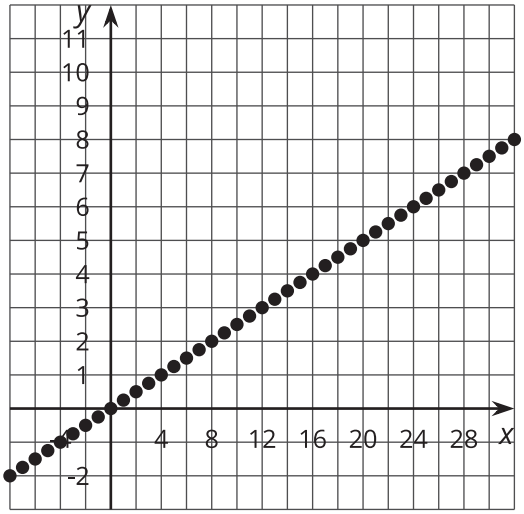
B



C

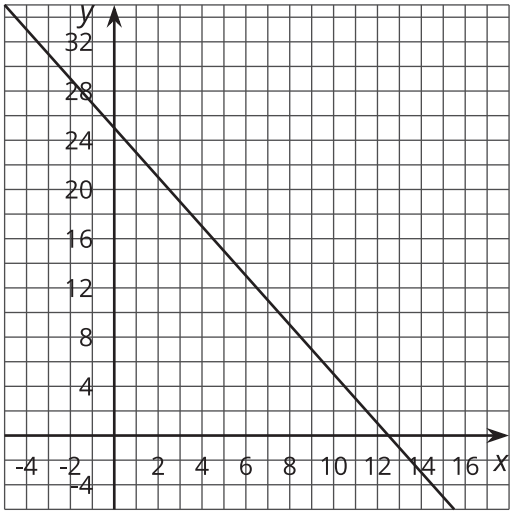


D

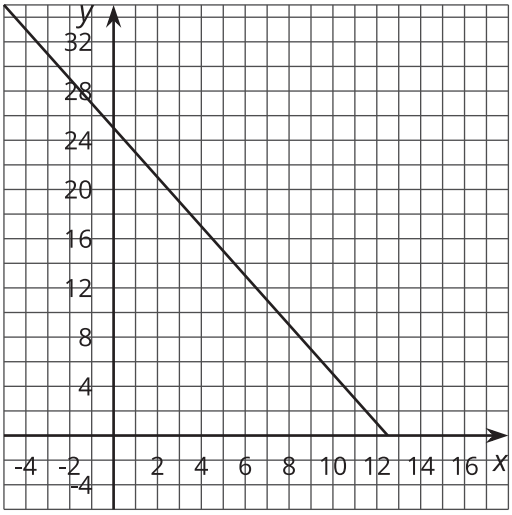


2. A tank that starts with 25 gallons of water drains at a rate of 2 gallons per minute. x represents time in minutes, and y represents volume of water in the tank in gallons.

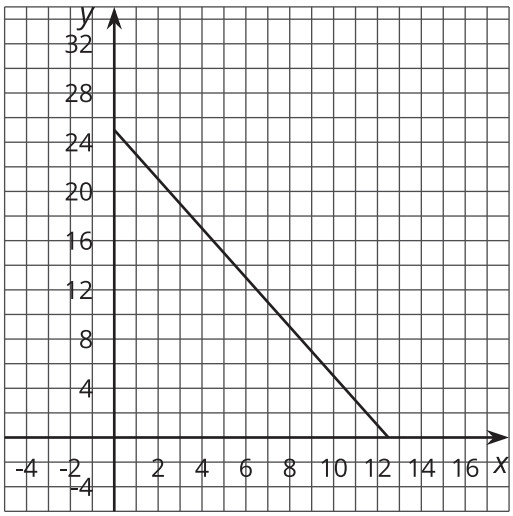
A



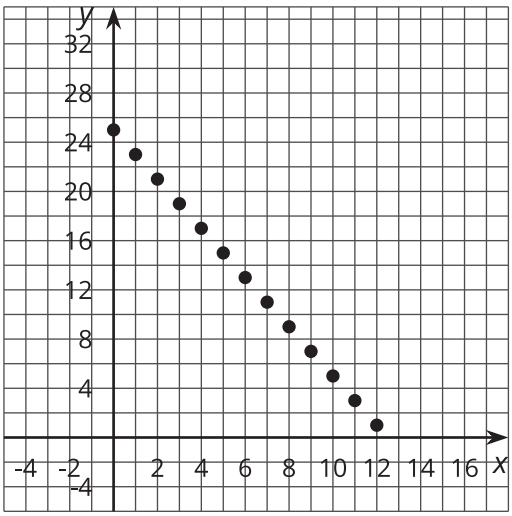
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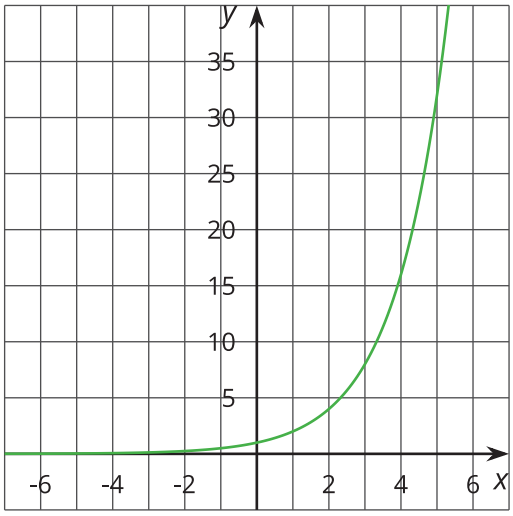


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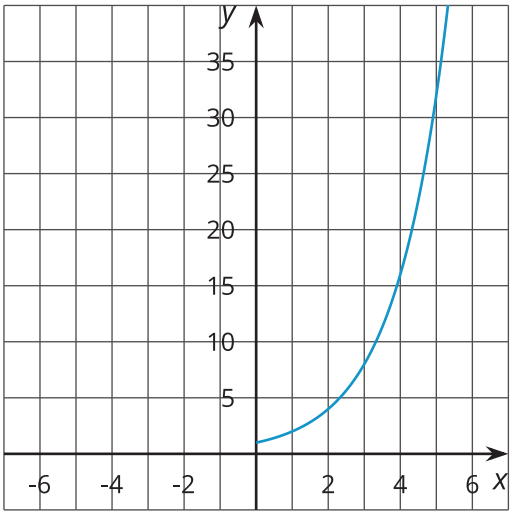


3. Someone folds a paper in half, then in half again repeatedly. After each fold, the thickness of the folded paper increases. x represents the number of folds, and y represents the thickness in layers.

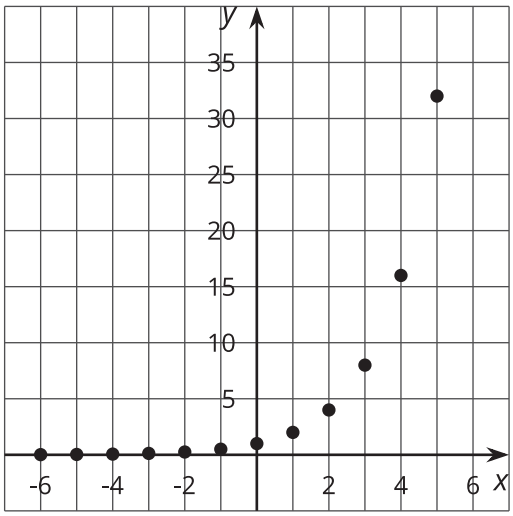
A



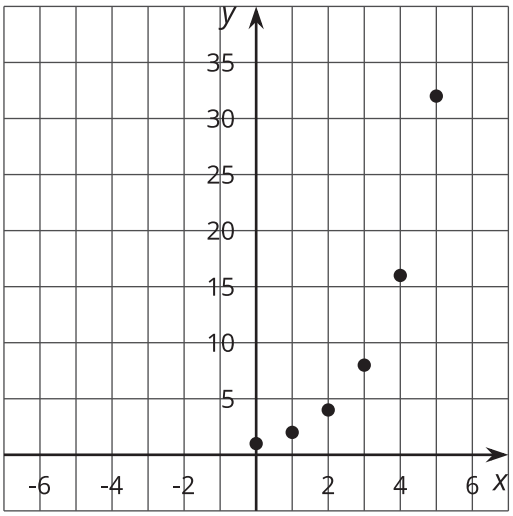
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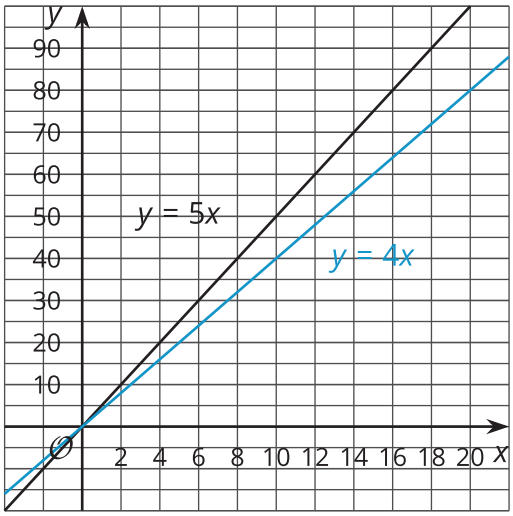


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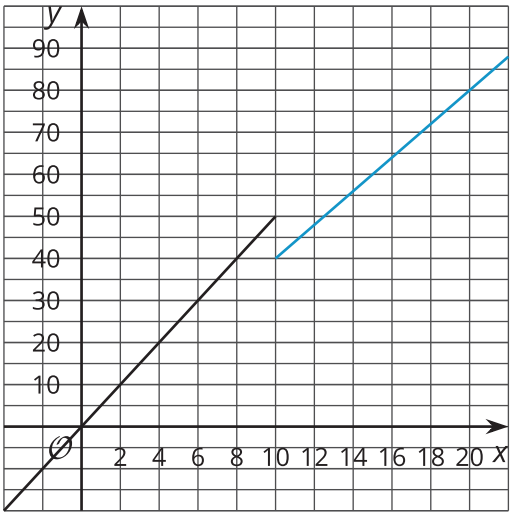


4. A t-shirt company offers deals on bulk purchases. Shirts cost $5 each if you buy less than 10, and they cost $4 each if you buy 10 or more. x represents the number of shirts bought, and y represents the cost of shirts in dollars.

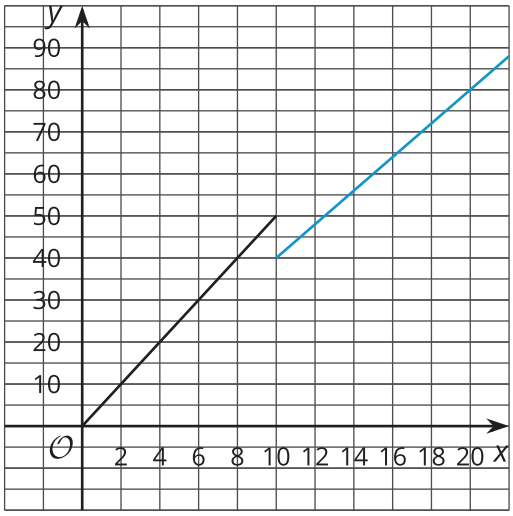
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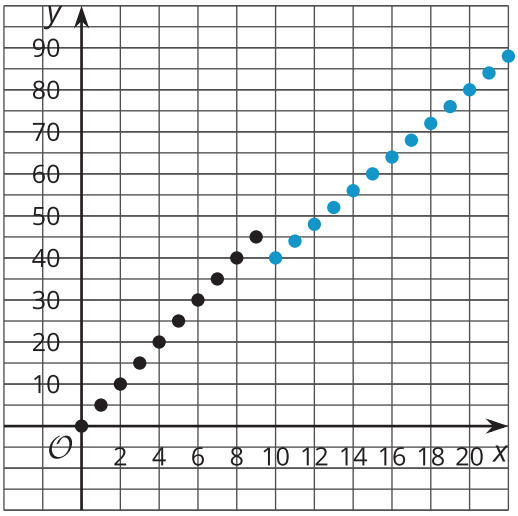
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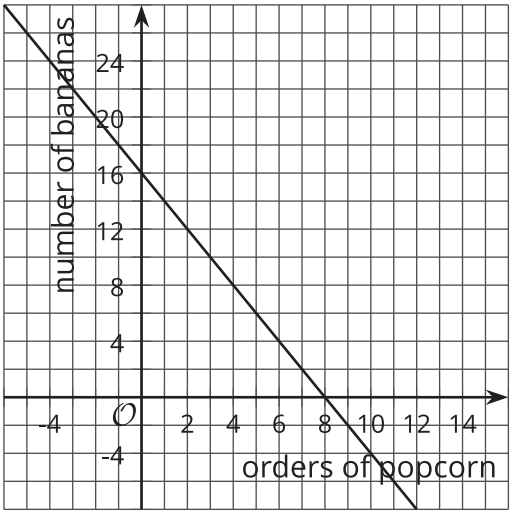


D



7.3 Refining the Representation

1. At the concession stand, popcorn costs $2 and bananas cost $1. Clare spent $16 on popcorn and bananas for her family.



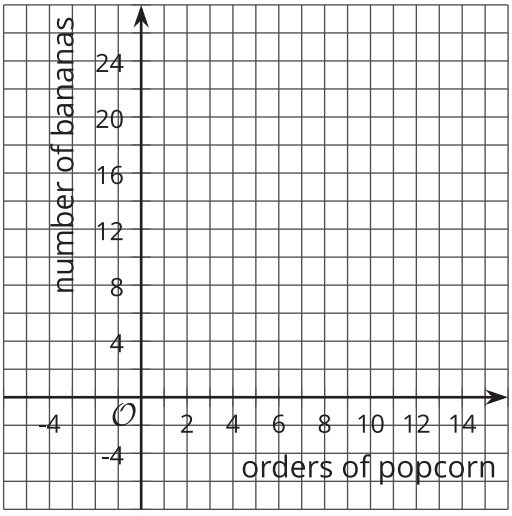
   a. Explain why each of these points on the graph do not make sense in the situation:

      i. $(-2, 20)$

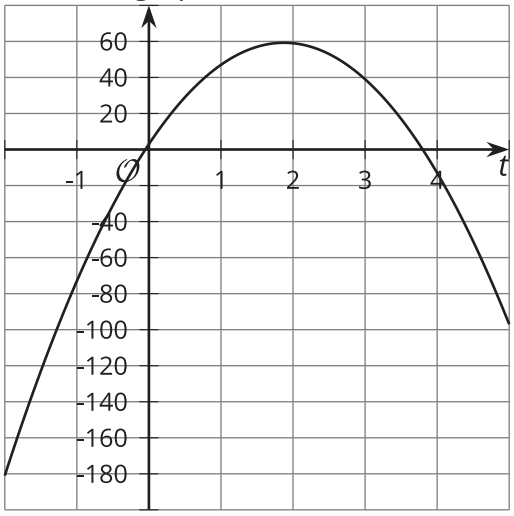
      ii. $(1.5, 13)$

      iii. $(10, -4)$

   b. Sketch a graph that better represents the situation. Explain your reasoning.

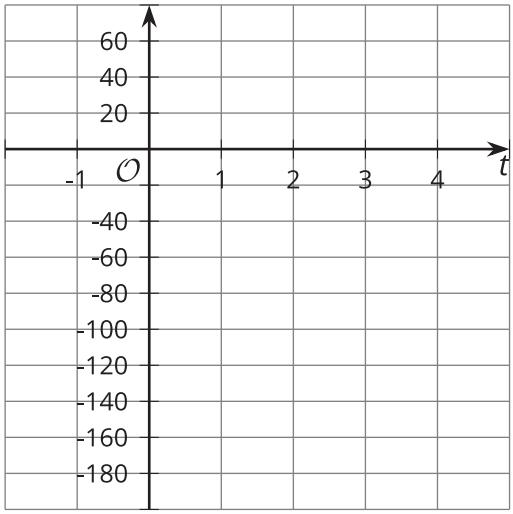


2. The height in feet of a baseball over time, in seconds, is modeled by the function h given by the equation $h(t) = 3 + 60t - 16t^2$. A graph of the function is shown.



a. Choose two points that are on the graph but do not make sense with the context. Explain your reasoning.

b. Sketch a graph that better represents the situation.



c. What point represents the baseball landing on the ground?