

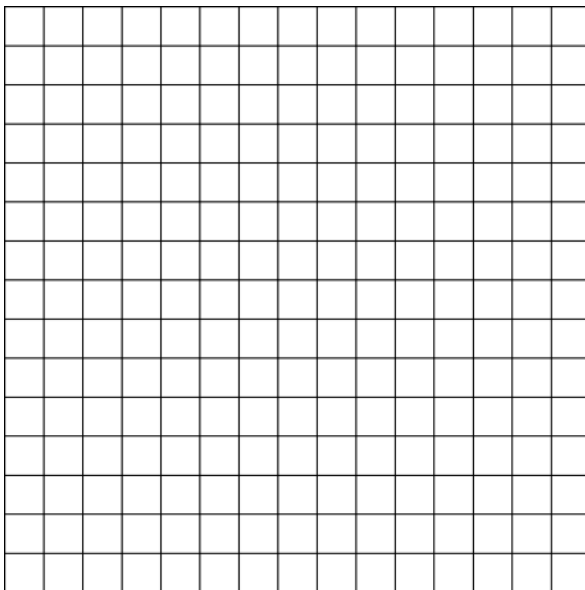
Understanding slope and y-intercept

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1. HiFi Beats sells subscriptions for its music streaming service. The amount you pay varies directly with the number of months you subscribe. A 3-month subscription costs \$9. Use this information to answer the following questions.
 - a. What is the constant of proportionality or the constant of variation? What does this number mean?

 - b. What is an equation that relates the cost, y , to the number of months, x ? How much would a 12-month subscription cost?

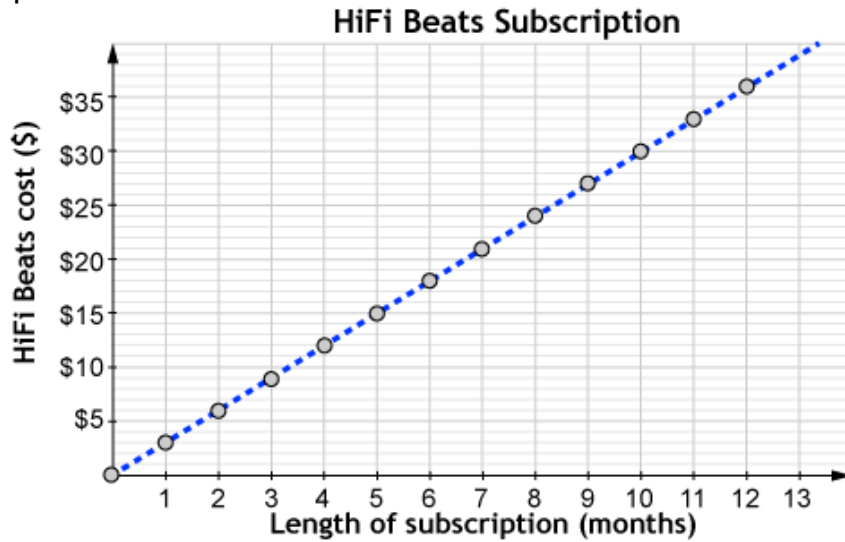
 - c. Create a graph of this relationship for 0-12 months of subscriptions.



Understanding slope and y-intercept

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2. Use the data for the cost of HiFi Beats and Daily Mix subscriptions to answer the following questions.



Month	Daily Mix cost (\$)
0	0
1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36
10	40
11	44
12	48

- What is the rate of change and y -intercept for HiFi Beats?
- What is the rate of change and y -intercept for Daily Mix?
- Are either of these proportional relationships? Why or why not?

Understanding slope and y-intercept

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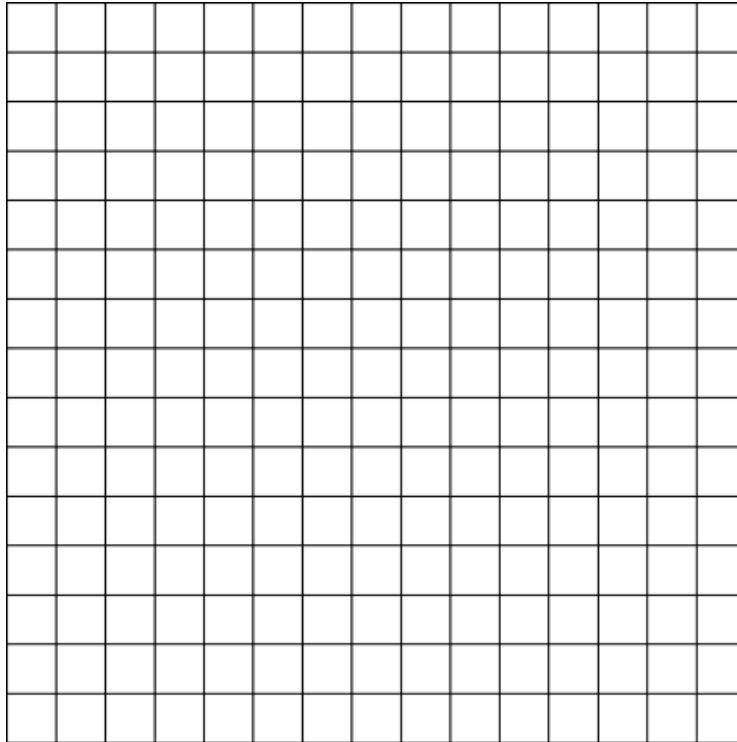
3. Create a three-column table comparing the costs of the two subscriptions over twelve months.

Month	HiFi Beats	Daily Mix
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Understanding slope and y-intercept

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4. Create a graph of the two linear functions representing HiFi Beats and Daily Mix subscription costs. Compare the graphs.

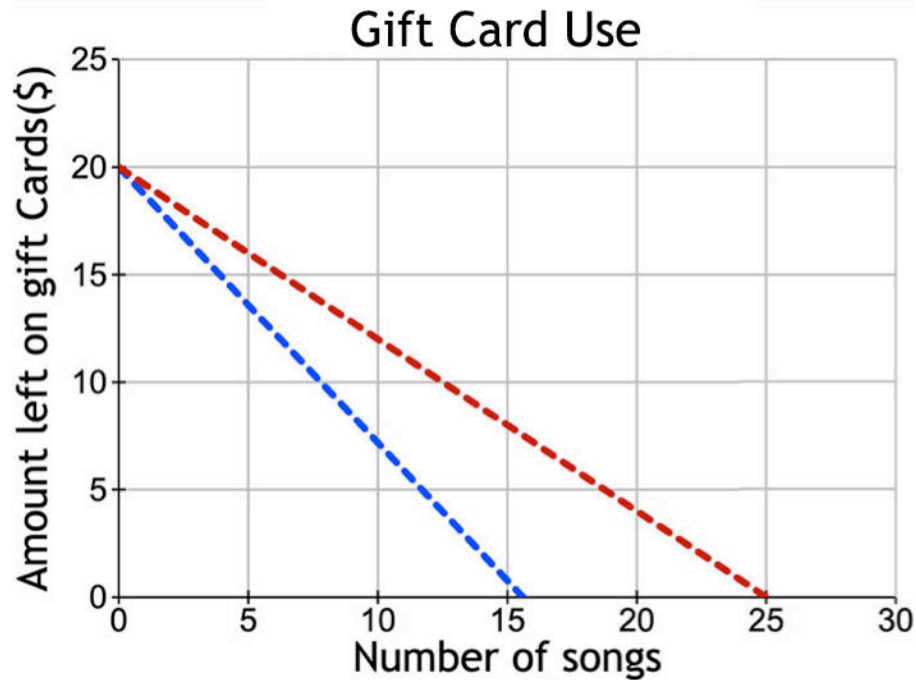


5. How do the tables support what you observed in the graphs? How do you know which service is more expensive?

Understanding slope and y-intercept

Block 5 Student Activity Sheet

6. Two friends each won \$20 gift cards to an online music store. Amara buys only popular Top 40 songs, which cost \$1.30 each. Michael has different tastes and only buys less popular songs that are not on the Top 40. These songs cost only \$0.80 each. Correctly label the line that represents the amount left on Amara's card and the line that represents the amount left on Michael's card.

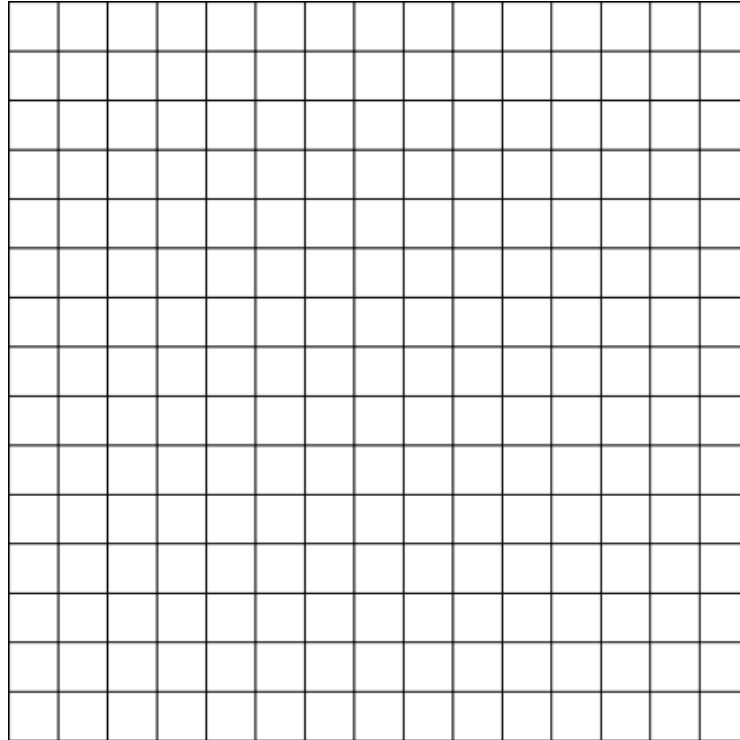


Understanding slope and y-intercept

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7. HiFi Beats is changing their subscription rate. HiFi Beats’s new payment plan is \$2 per month (instead of \$3 as it was before), but the company has added a sign-up fee of \$10. Daily Mix will continue to charge \$4 a month with no sign-up fee.

a. Create a graph with the two linear equations.



b. Does the new pricing structure of the HiFi Beats subscription rate still represent a proportional relationship?

Understanding slope and y-intercept

Block 5 Student Activity Sheet

- c. Create a three-column table comparing the costs of the two subscriptions over twelve months.

Month	HiFi Beats	Daily Mix
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

8. HiFi Beats is changing their subscription rate. Their new payment plan is a monthly rate of \$2 per month (instead of \$3 as it was before), but the company added a sign-up fee of \$10. Daily Mix will continue to charge \$4 a month with no sign-up fee. Use your graph or table to fill in the blanks.

4	0 to 4	0 to 3	5	6
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For months, Daily Mix costs less. For a subscription that lasts exactly months, the subscription costs are equivalent. For any subscription months or longer, HiFi Beats costs less.

Understanding slope and y-intercept

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9. REINFORCE

- a. Write an equation for Amara and an equation for Michael to model the amount of money remaining on the gift card, y , for the number of songs purchased, x .

Amara:

Michael:

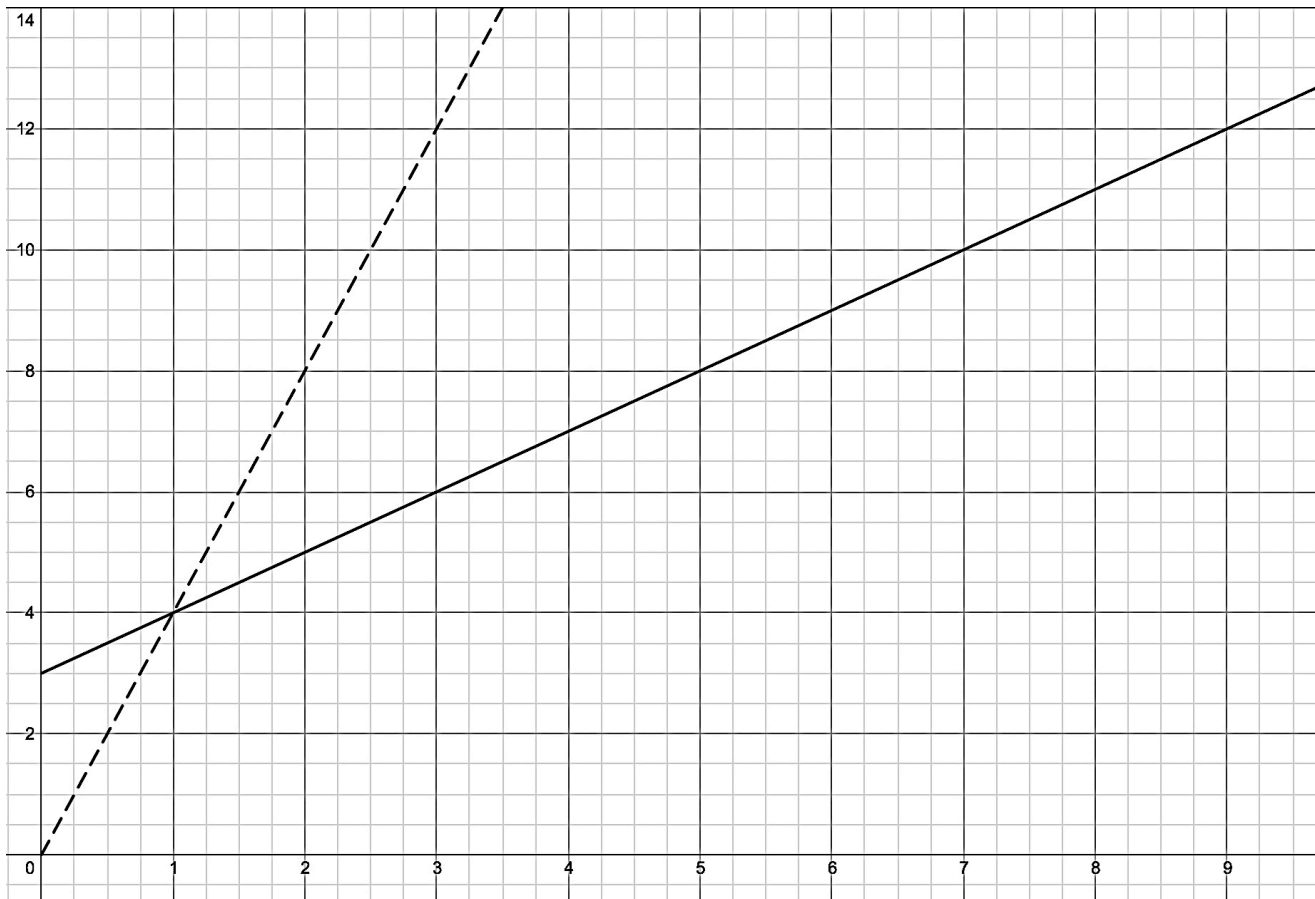
- b. How many songs can Amara and Michael buy with each of their cards? Explain.

10. **REINFORCE** Write two linear equations that represent HiFi Beats's and Daily Mix's subscription costs, c , in terms of the number of months, m .

Understanding slope and y-intercept

Block 5 Student Activity Sheet

11. **REINFORCE** Describe a situation that could be represented by the following graph. Label your axes to match the problem situation you create.



Understanding slope and y-intercept

Block 5 Student Activity Sheet

12. **REINFORCE** Interpret what is happening over the following x -intervals in terms of the situation you described in the previous question.

a. Between $x = 0$ and $x = 1$:

b. At $x = 1$:

c. Between $x = 1$ and $x = 10$:

13. **REINFORCE** How can you change the situation so that both graphs represent proportional relationships?