

GOLD EDITION

PRACTICE COACH PLUS



Mathematics

6



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Equivalent Ratios



Coached Instruction

- Compare Talia's and Armando's methods of solving the problem below.

New books are purchased for a library each month. For every 2 nonfiction books purchased, 5 fiction books are purchased. If 155 fiction books are purchased this month, how many nonfiction books are purchased?

TALIA'S METHOD

I made a ratio table. The ratio of nonfiction books to fiction books is 2:5. To find an equivalent ratio, I multiplied 2 and 5 by 10 to get $\frac{20}{50}$. Then I multiplied by 2 to find another equivalent ratio, $\frac{40}{100}$.

		×10	×2	
		↘ ↙		
Non-Fiction	2	20	40	?
Fiction	5	50	100	155
		↖ ↗		
		×10	×2	

I added the values in the bottom row: $5 + 50 + 10 = 155$.

Then I added the values in the top row: $2 + 20 + 40 = 62$.

$$\frac{62}{155} = \frac{2}{5}$$

If 155 fiction books are purchased, 62 nonfiction books are purchased.

ARMANDO'S METHOD

The ratio of nonfiction books to fiction books is $\frac{2}{5}$. I looked for an equivalent ratio with a denominator of 155.

$$\frac{2}{5} = \frac{?}{155}$$

Since $155 \div 5 = 31$, I multiplied 2×31 to find the missing term.

$$\frac{2}{5} = \frac{2 \times 31}{5 \times 31} = \frac{62}{155}$$

So, 62 nonfiction books are purchased if 155 fiction books are purchased.

DISCUSS

How is Armando's method different from Talia's method?

How is it similar?

**APPLY**

A dressmaker needs 7 yards of fabric for every 2 dresses she makes. If she has 287 yards of fabric, how many dresses can she make? Show your work and explain your reasoning.

- A. 41
- B. 82
- C. 168
- D. 282



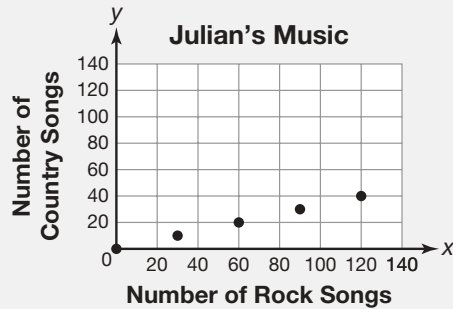
ERROR ANALYSIS

► Analyze Nell's method for solving the problem below.

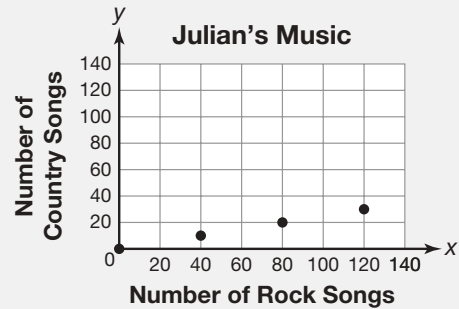
There are 160 songs on Julian's phone. The ratio of rock songs to country songs is 3:1.

Which graph shows the relationship between the number of rock and country songs?

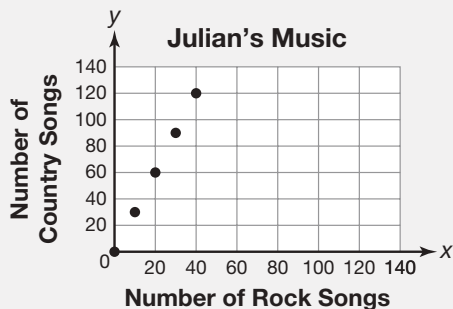
A.



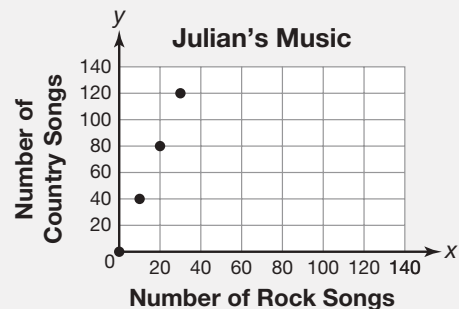
C.



C.



D.



Nell made a mistake solving the problem.

NELL'S METHOD

I made a table to show a 3 to 1 ratio. Since there are 160 songs, I used a 30 to 10 ratio.

Julian's Music

Rock	30	60	90	120
Country	10	20	30	40

There are 120 rock songs and 40 country songs.

I think Choice C is correct.

DISCUSS

Did Nell calculate the ratios correctly?
Did Nell's data match the graph she chose?



APPLY

What mistake did Nell make?

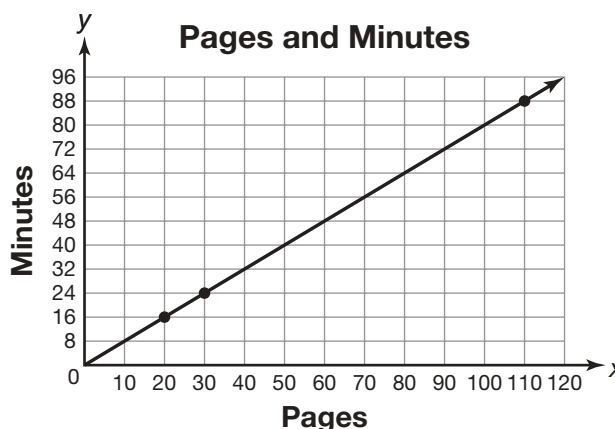
Solve the problem. Which graph should Nell have chosen?

► **Compare Jaylin's and Natasha's methods of solving the problem below.**

When reading at a constant rate, Francine read the first 20 pages of a book in 16 minutes and the next 30 pages in 24 minutes. If she continues to read at the same rate, how long will it take for her to finish the last 110 pages?

JAYLIN'S METHOD

Francine read 20 pages in 16 minutes and 30 pages in 24 minutes. Since she reads at a constant rate, I know the rates $\frac{20}{16}$ and $\frac{30}{24}$ are equivalent. I graphed the points (20, 16) and (30, 24). Then I drew a line from the origin to connect the points.



The line passes through the point (110, 88), so the rate $\frac{110}{88}$ is equivalent to the given rates.

It will take Francine 88 minutes to read the final 110 pages.

NATASHA'S METHOD

Since Francine reads at a constant rate, I made a rate table to organize the data. The first column represents the 20 pages she read in 16 minutes. The second column represents the 30 pages she read in 24 minutes.

Pages	20	30	60	110
Minutes	16	24	48	?

$\times 2$
 $\times 2$

Since $110 = 20 + 30 + 60$, I wrote 60 and 110 to complete the Pages row.

$30 \times 2 = 60$, so I multiplied 24×2 to find the third value in the Minutes row, 48.

I added to find the last data value in the Minutes row:

$$16 + 24 + 48 = 88.$$

All the ratios in the table are equivalent, so it will take Francine 88 minutes to read the final 110 pages.

DISCUSS

Which method would be better to use to find more than one equivalent rate?

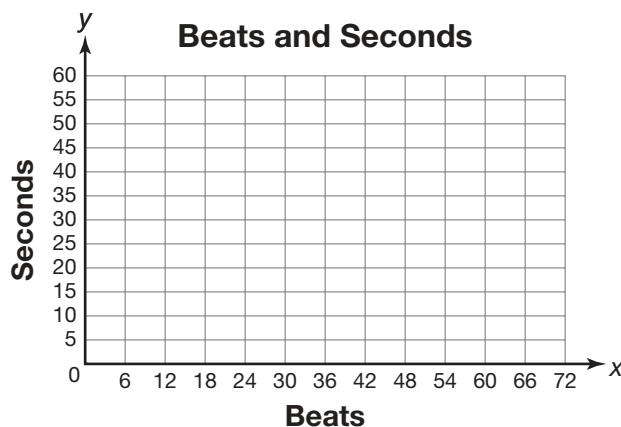
Why?



APPLY

Ernie's heart is beating at a constant rate. It beat 12 times in 10 seconds and 18 times in 15 seconds. How many times will it beat in 55 seconds?

Use the graph below or make a table to solve the problem. Show your work and explain your reasoning.



Lesson Practice | Part 1

Choose the correct answer.

1. Which ratio is equivalent to $\frac{3}{10}$?

- A. $\frac{9}{10}$
- B. $\frac{9}{13}$
- C. $\frac{9}{20}$
- D. $\frac{9}{30}$

2. Which ratio is **not** equivalent to $\frac{5}{3}$?

- A. $\frac{35}{21}$
- B. $\frac{25}{15}$
- C. $\frac{18}{12}$
- D. $\frac{10}{6}$

3. Which pair of ratios are equivalent?

- A. $\frac{6}{9}$ and $\frac{12}{16}$
- B. $\frac{9}{15}$ and $\frac{18}{30}$
- C. $\frac{10}{18}$ and $\frac{16}{27}$
- D. $\frac{12}{15}$ and $\frac{15}{20}$

4. A television station shows 3 commercials every 12 minutes. At that rate, how many commercials will the station show in 60 minutes?

- A. 30
- B. 15
- C. 12
- D. 8

5. The table below shows the number of cups of sugar and of flour needed to make some cookies. If Alex uses 5 cups of sugar to make cookies, how many cups of flour does he need?

Cookie Ingredients

Cups of Flour	6	9	12	?
Cups of Sugar	2	3	4	5

- A. 20 cups
- B. 15 cups
- C. 13 cups
- D. 6 cups

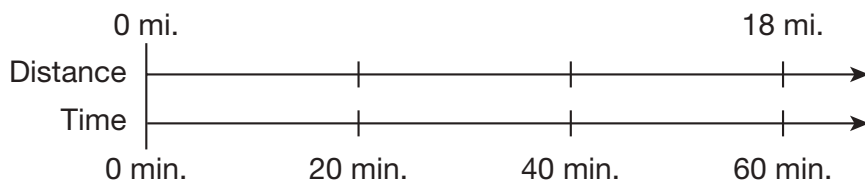
6. The ratio of blue marbles to red marbles in a bag is 11:9. If there are 99 blue marbles in the bag, how many red marbles are there?

- A. 18
- B. 35
- C. 81
- D. 121

7. The ratio of boys to girls in a chorus is 5 to 6. Which shows an equivalent ratio?

- A. 10 boys to 12 girls
- B. 15 boys to 19 girls
- C. 20 boys to 25 girls
- D. 24 boys to 28 girls

8. When biking at a constant speed, Abdul can travel 6 miles in 20 minutes. He made the double number line below to help him find how many miles he can bike in different amounts of time. How many miles can he bike in 40 minutes?

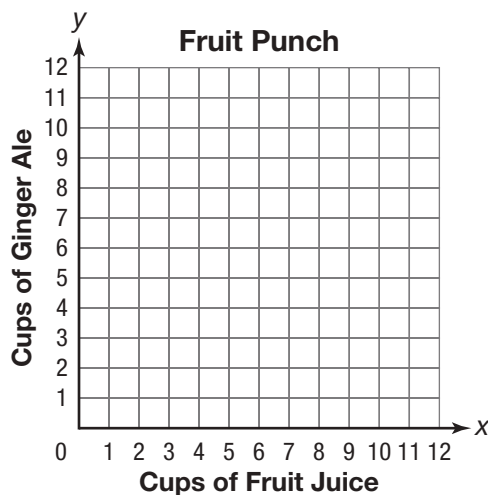


- A. 2 miles
 B. 12 miles
 C. 18 miles
 D. 46 miles
9. The table shows the number of cups of fruit juice and of ginger ale needed to make a fruit punch.

Fruit Punch

Cups of Fruit Juice (x)	2	4	6	8
Cups of Ginger Ale (y)	3	6	?	12

- A. Do the pairs of values in the table represent equivalent ratios? Show your work or explain how you determined your answer.
- B. Plot the ordered pairs from the table on the coordinate grid below. Then use the graph to determine how many cups of ginger ale must be mixed with 6 cups of fruit juice to make the punch.



Lesson Practice | Part 2

Choose the correct answer.

1. Which number makes this sentence true?

$$21:30 = x:50$$

- A. $x = 30$
- B. $x = 32$
- C. $x = 35$
- D. $x = 41$

2. A baseball team has won 16 of its first 27 games. At the rate, how many games will it win in a 162-game schedule?

- A. 66
- B. 85
- C. 96
- D. 151

3. The table below shows the number of hours and the number of pages that Dara read?

Dara's Reading

Number of Hours (x)	2	4	6	x
Number of Pages (y)	72	144	216	540

At the rate that Dara is reading, how long will it take her to read 540 pages?

- A. 18 hours
- B. 15 hours
- C. 12 hours
- D. 9 hours

4. Which number makes this sentence true?

$$32:40 = 48:x$$

- A. $x = 56$
- B. $x = 60$
- C. $x = 64$
- D. $x = 72$

5. Which pair of ratios is equivalent?

- A. $\frac{3}{12}$ and $\frac{5}{20}$
- B. $\frac{5}{15}$ and $\frac{9}{24}$
- C. $\frac{6}{16}$ and $\frac{10}{24}$
- D. $\frac{8}{18}$ and $\frac{11}{27}$

6. The table below shows the cost for renting a bicycle at Ike's Bikes.

Bike Rentals

Number of Hours (x)	2	4	6	9
Cost in Dollars (y)	16	32	48	

Based on the rate in the table, what is the cost for 9 hours?

- A. \$51
- B. \$72
- C. \$78
- D. \$81

7. Miguel typed 270 words in 6 minutes. His paper is 630 words. If he keeps typing at the same rate, in how many more minutes will Miguel finish typing his paper?
- A. 8 minutes
 - B. 14 minutes
 - C. 16 minutes
 - D. 22 minutes

8. The ratio of boys to girls in a tennis camp is 3:5. If there are 64 campers, how many are girls?
- A. 24
 - B. 32
 - C. 36
 - D. 40

9. The table shows the relationship between feet and fathoms.

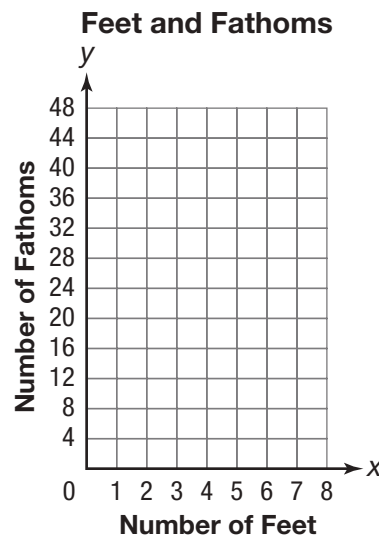
Feet and Fathoms

Number of Feet (x)	2	3	4	7
Cost in Fathoms (y)	12	18	24	x

- A. Are the ratios equivalent? Explain your answer.

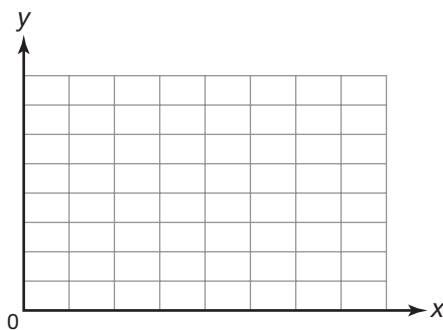
- B. What is the value of x ?

- C. Plot the ordered pairs from the table.



10. A college baseball team won 5 games for every 3 games they lost. They played 64 games this year. How many games did they win? Explain your answer.

11. Zoe has a total of 42 quarters and dimes. The ratio of quarters to dimes is 2:1. Make a graph to show the relationship between the quarters and dimes.



How many of each coin does Zoe have?

12. Mr. Norris has driven 18 miles in 24 minutes.

If he continues to drive at that speed, how many miles will Mr. Norris drive in 40 minutes?
Show your work and explain your answer.

If he continues to drive at that speed, how many minutes will it take Mr. Norris to drive 45 miles? Show your work and explain your answer.