



*Math in Focus: Singapore Math* National Institute  
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# *Looking Closely at Course 1-3 Grade level Content*

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*“Some of the highest  
priority content for college  
and career is found in  
grade 6-8”*



Houghton  
Mifflin  
Harcourt

# The study of ratio and proportional relationships extends to...

**measurement**

**Avg and  
instantaneous  
rates of  
change**

**economics**

**Similar  
Figures**

**density**

**Magnetic  
field  
strength**

**cooking**

**discount**

**Sine, cosine,  
tangent, etc**

**Agricultural  
statistics**

**ETC!**

# Ratio & Proportional Relationships Progression

Grade 6



# Course 1

## Ratio & Rate

I have 12 blue cubes and 8 red cubes

Name this ratio?

# Course 1

## Ratio & Rate

Meghan make fruit punch with apple, orange and grape juice at a ratio of 5:3:2.

There are 150 oz more apple juice than grape juice.

# Course 1

## Ratio & Rate

*Math Journal* The ratio of the number of beads collected by Jane to the number of beads collected by Jill is  $7 : 3$ . Jane gave some beads to Jill. Is it possible for both Jane and Jill to have the same number of beads after Jane gave some beads to Jill? Explain why you think so.

Today the ratio of Elinor's age to her mother's age is  $3 : 8$ . After 15 years, the ratio will become  $6 : 11$ .

- a) Find Elinor's age today.
- b) Find her mother's age after 15 years.

# Course 1

## Ratio & Rate

A machine can pack 70 boxes of spaghetti in 5 minutes.  
At this rate, how many boxes of spaghetti can it pack in 8 minutes?

A **unit rate** compares a quantity to one unit of a different quantity.

# Course 1

## Ratio & Rate

- 12 A supermarket sells the three brands of rice shown in the table below.

Brand	Mass of Rice	Price
A	500 g	\$1.20
B	5 kg	\$9.80
C	10 kg	\$18.90

Raimondo wants to buy 30 kilograms of rice.

- Which brand of rice should he buy to get the best deal, assuming that all three brands are of the same quality?
- How much will he save if he buys the cheapest brand of rice as compared to the most expensive one?

Lucas ran round a field at a speed of 8 meters per second. How long run a distance of 96 meters?

**Method 1**

$$8 \text{ m} \longrightarrow 1 \text{ s}$$

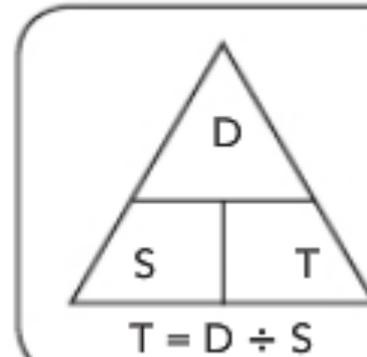
$$96 \text{ m} \longrightarrow \frac{96}{8} = 12 \text{ s}$$

Lucas took 12 seconds to run 96 meters.

**Method 2**

$$\begin{aligned} \text{Time} &= \text{Distance} \div \text{Speed} \\ &= 96 \div 8 \\ &= 12 \text{ s} \end{aligned}$$

Lucas took 12 seconds to run 96 meters.



# Course 1

## Ratio & Rate

Will, Micah, and Sue went to dinner. Will paid  $\frac{1}{3}$  of the dinner bill. Micah and Sue paid in the ratio 2 : 5. If Sue paid \$6 more than Will, how much did the dinner cost?

# Ratio & Proportional Relationships Progression

Grade 6

Representing and Reasoning about Ratios

Strategies for Problem Solving

Grade 7

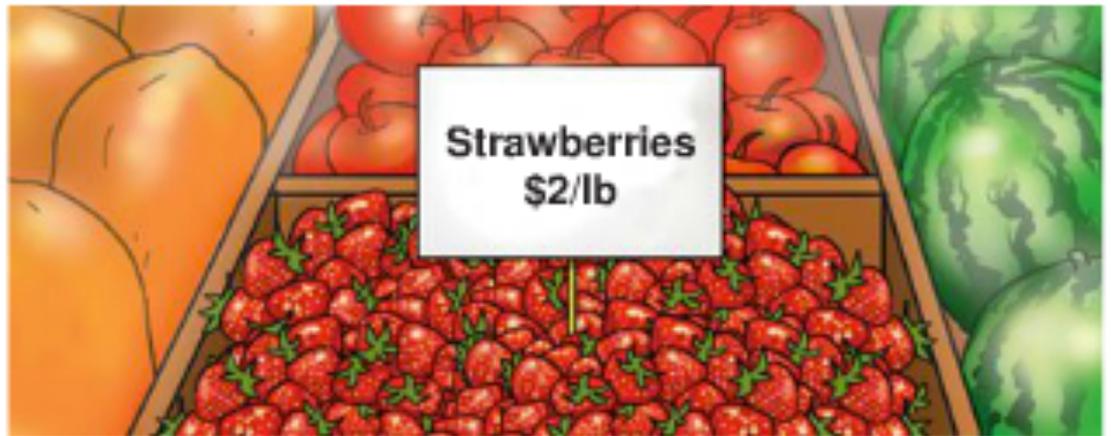
Recognize & Represent proportional relationships

Solve multi-step problems

Make connections to Geometry & Statistics

# Course 2

## Direct Proportion



So, 2 pounds of strawberries cost:  $\$2 \cdot 2 = \$4$

3 pounds of strawberries cost:  $\$2 \cdot 3 = \$6$ , and so on.

What else do you know?

Describe the relationship with words...with symbols.

# Course 2

## Direct Proportion

### Think Math

Adam says the equation  $5y + 2y = 7$  represents a direct proportion. Susan disagrees with him. Who is correct?

$$\frac{1}{2}y = 3x$$

$$y - 2 = 5x$$

# Course 2

<b>Volume of Water (<math>g</math> gallons)</b>	4	10	20
<b>Number of Fish (<math>f</math>)</b>	6	15	30

<b>Time (<math>t</math> hours)</b>	1	2	3
<b>Distance Traveled (<math>d</math> centimeters)</b>	9	18	21

Is the relationship directly proportional? How do you know?

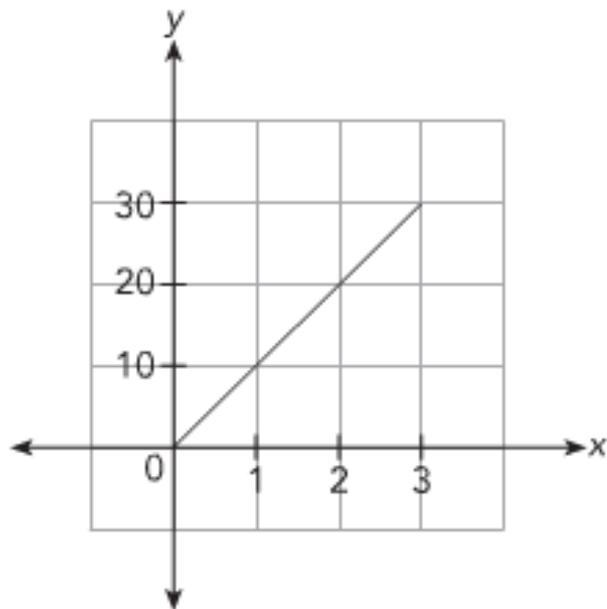
What is the constant of proportionality? Write the equation.

# Course 2

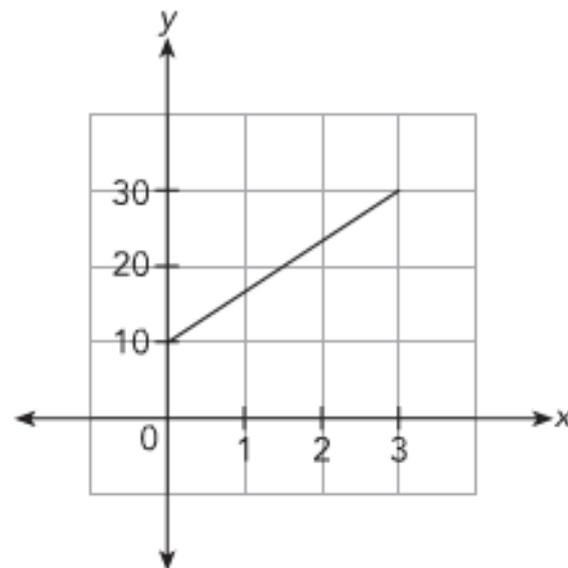
## Direct Proportion

Tell whether each graph represents a direct proportion. If so, find the constant of proportionality. Then write a direct proportion equation.

a)



b)



*Math Journal*

direct proportion.

Explain how you can tell whether a line represents a

# Course 2

## Direct Proportion

**21**  *Math Journal*  $y$  varies directly as  $x$ . Describe how the value of  $y$  changes when the value of  $x$  is tripled.

**22**  *Math Journal* Jenny wants to buy some blackberries. Three stores sell blackberries at different prices:

**Store A**



\$2.40/lb

**Store B**



\$1.28/8 oz

**Store C**

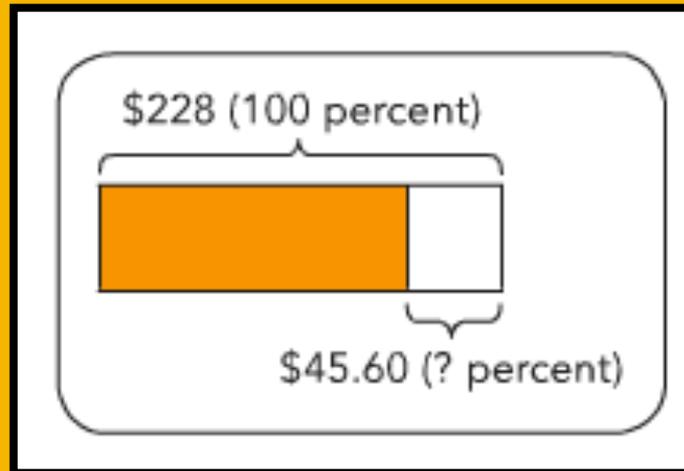


\$1.08/6 oz

Which store has the best deal? Give your reasons.

# Course 2

## Direct Proportion



The regular price of a phone was \$228. During a sale, its price was marked down by \$45.60. Use a proportion to find the percent discount.

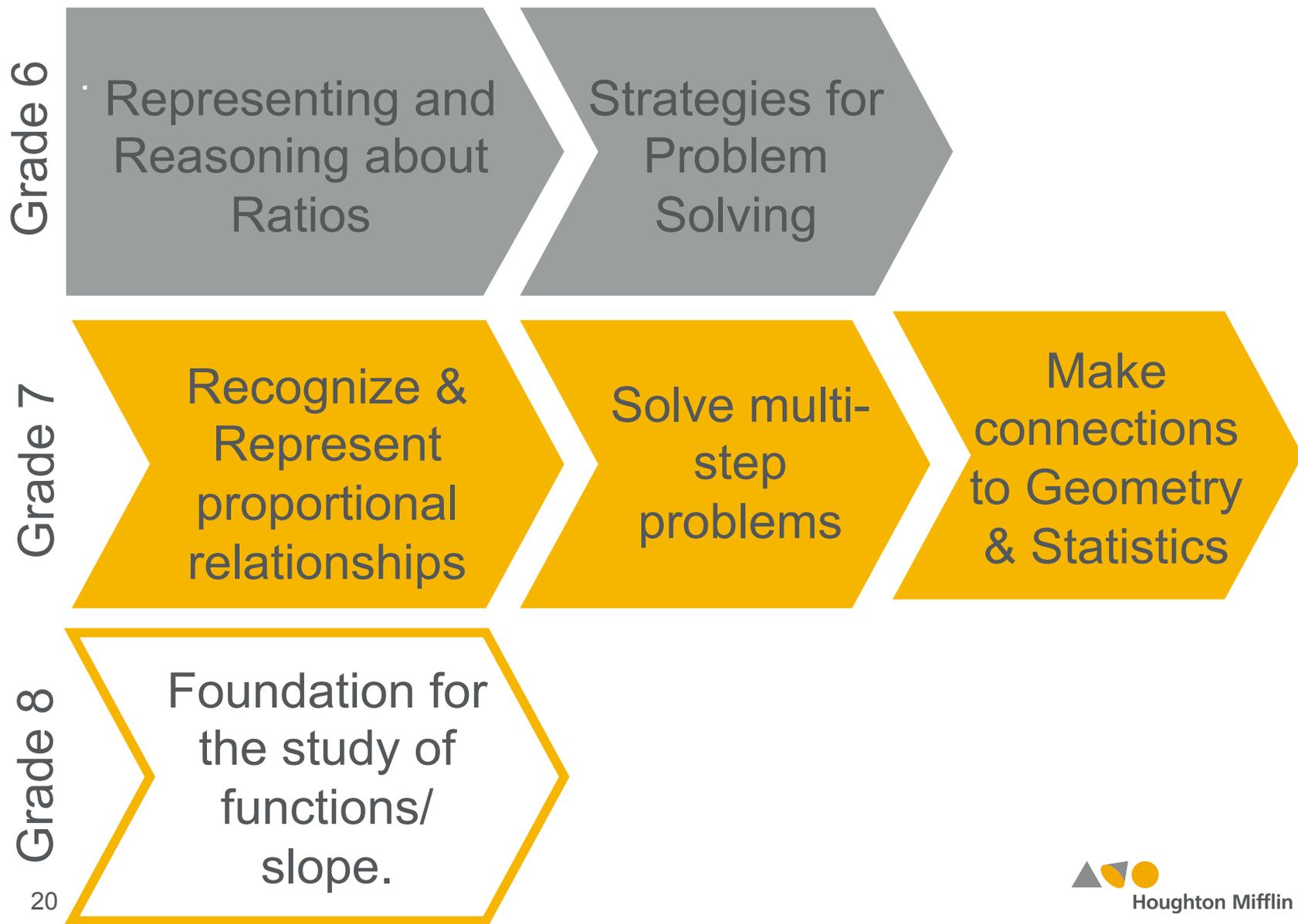
# Course 2

## Direct Proportion



- 1 Tom is French, but lives in United States. On a visit to Germany, he saw a book that cost 25.99 euros plus 7% VAT (value-added tax). At that time, one euro was approximately equal to 0.726 U.S. dollars. In the United States, Tom could have bought the same book for 23.99 U.S. dollars plus 6% tax. Should Tom have bought the book in Germany? Explain your answer.

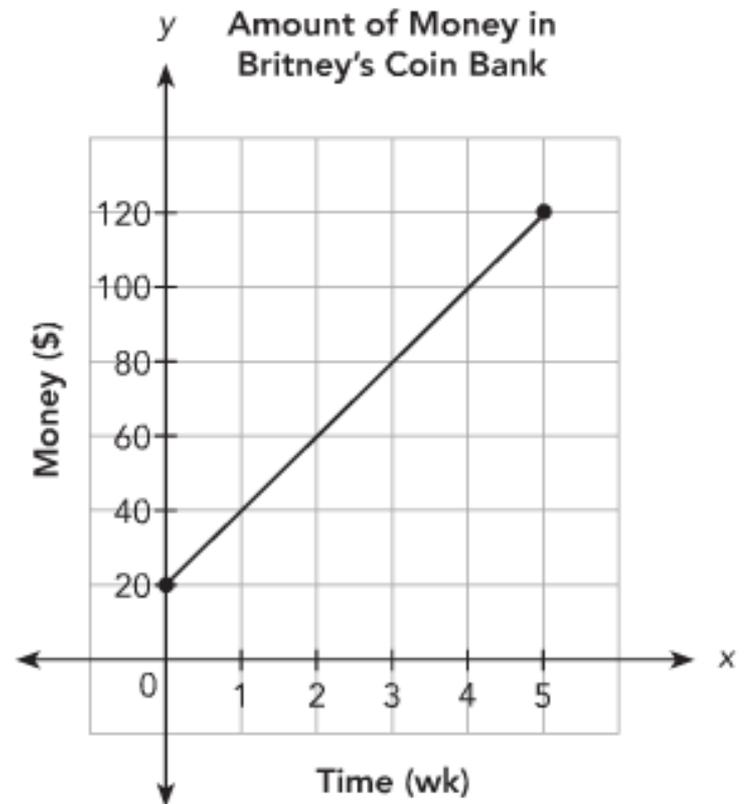
# Ratio & Proportional Relationships Progression



# Course 3

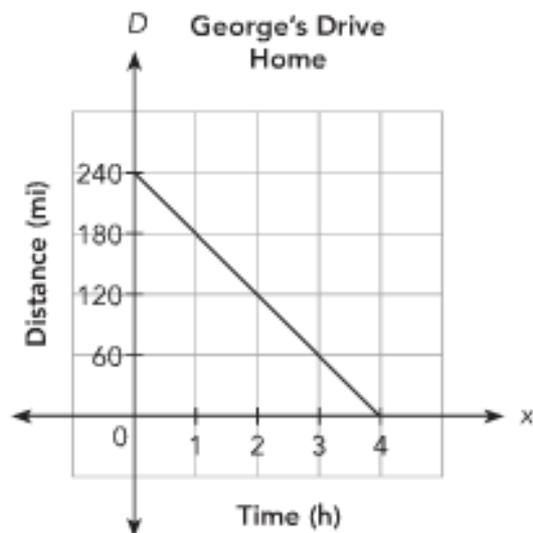
## Slope

Is Britney adding money at a faster rate or is Scarlet taking out money at a faster rate? Explain.

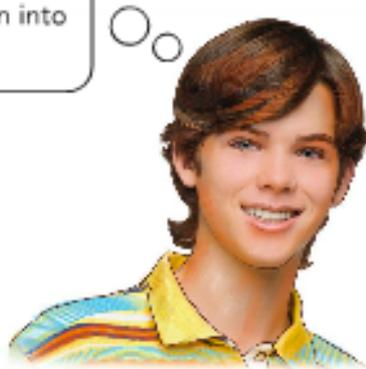


Britney and Scarlet each have a coin bank. Britney starts with a certain amount of money and adds money at regular intervals. Scarlet starts with a different amount of money and takes money out over time. The amount of money,  $y$  dollars, in Scarlet's coin bank after  $x$  weeks is given by the equation  $y = -24x + 120$ . The graph shows the amount of money in Britney's coin bank after  $x$  weeks.

Isaac and George are brothers who live at the same house, but go to different cities for vacation. When their vacation is over, they begin driving back home at the same time, but drive home at different speeds. Isaac's distance  $D$  miles from their house  $x$  hours after he starts driving is given by the equation  $D = -50x + 150$ . The graph shows George's distance  $D$  miles from their house  $x$  hours after he starts driving home.



When comparing rates of change in **c**), you only look at the absolute value of the slope. The sign is not taken into consideration.

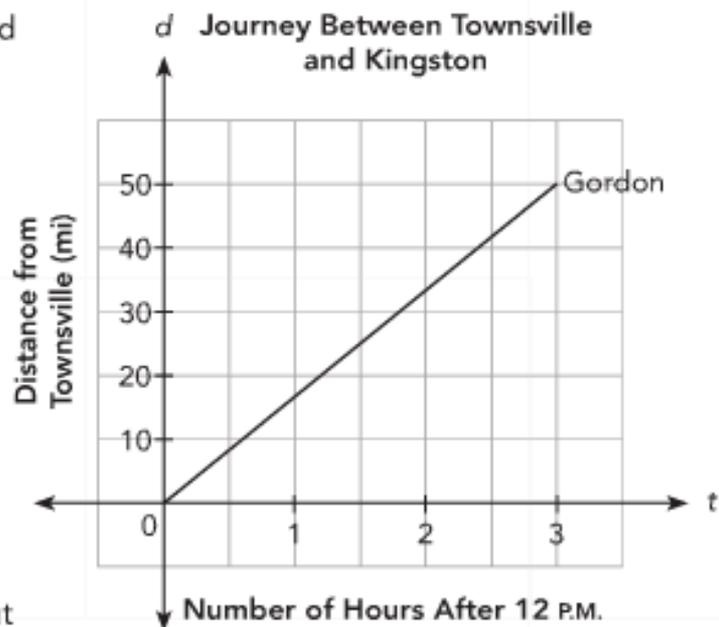


- Find the vertical intercept of George's graph and explain what information it gives about the situation.
- Find the slope of George's graph and explain what information it gives about the situation.
- Which brother is driving faster? How do you know?

# Brain @ Work

2 Gordon left Townsville at 12 P.M. and started biking to Kingston 50 miles away. One and a half hours later, Jonathan left Kingston and started biking toward Townsville at a speed of 20 miles per hour. The graph shows Gordon's distance,  $d$  miles, from Townsville after  $t$  hours.

- Copy the graph. Then draw a line to represent Jonathan's distance from Kingston after  $t$  hours.
- Find the slope of Gordon's graph and explain what information it gives about this situation.
- Write an equation to represent each person's distance from Townsville after  $t$  hours.





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*Thank you!*

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