

WAMC Lab Template

Math Concept(s): Chapter 5 Employment Basics

Source / Text: Financial Algebra by Gerver and Sgroi

Developed by: Penelopy Perkins

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Date: Summer In-service 2019

Attach the following documents:

Lab Instructions

- Using the internet investigate the minimum wage of several states
- Research the salaries of your favorite celebrity, a local real estate agent, an Uber driver and a first year Washington State teacher
- Graph the one-month salary of each career as a piece wise function

Student Handout(s)

Rubric and/or Assessment Tool

- Student handout, graph and reflection

Short Description (Be sure to include where in your instruction this lab takes place):

End of chapter 5-3 Commissions, Royalties & Piecework pay

Lab Plan

Lab Title: Job of your Dreams

Prerequisite skills: Linear and piecewise functions

Lab objective: Understand the various processes and essential skills needed to choose a career and to graph linear and piecewise functions

Standards:

CCSS-M:

- A-CED1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- F-LF: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Standards for Mathematical Practice:

- MP2. Reason abstractly and quantitatively
- MP5. Use appropriate tools strategically

- MP7. Look for and make use of structure
-

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)			
<input type="checkbox"/> Global Awareness	<input checked="" type="checkbox"/> Financial/Economic/Business/Entrepreneurial Literacy	<input type="checkbox"/> Civic Literacy	
<input type="checkbox"/> Health/Safety Literacy	<input type="checkbox"/> Environmental Literacy		
21st Century Skills (Check those that students will demonstrate in the above activity.)			
LEARNING AND INNOVATION	INFORMATION, MEDIA & TECHNOLOGY SKILLS	LIFE & CAREER SKILLS	Productivity and Accountability
<u>Creativity and Innovation</u>	<u>Information Literacy</u>	<u>Flexibility and Adaptability</u>	<u>Manage Projects</u>
<input checked="" type="checkbox"/> Think Creatively	<input checked="" type="checkbox"/> Access and Evaluate Information	<input type="checkbox"/> Adapt to Change	<input checked="" type="checkbox"/> Produce Results
<input type="checkbox"/> Work Creatively with Others	<input checked="" type="checkbox"/> Use and manage Information	<input checked="" type="checkbox"/> Be Flexible	<u>Leadership and Responsibility</u>
<input type="checkbox"/> Implement Innovations	<u>Media Literacy</u>	<u>Initiative and Self-Direction</u>	<input type="checkbox"/> Guide and Lead Others
<u>Critical Thinking and Problem Solving</u>	<input checked="" type="checkbox"/> Analyze Media	<input checked="" type="checkbox"/> Manage Goals and Time	<input type="checkbox"/> Be Responsible to Others
<input checked="" type="checkbox"/> Reason Effectively	<input type="checkbox"/> Create Media Products	<input checked="" type="checkbox"/> Work Independently	
<input type="checkbox"/> Use Systems Thinking	<u>Information, Communications and Technology (ICT Literacy)</u>	<input checked="" type="checkbox"/> Be Self-Directed Learners	
<input checked="" type="checkbox"/> Make Judgments and Decisions	<input checked="" type="checkbox"/> Apply Technology Effectively	<u>Social and Cross-Cultural</u>	
<input checked="" type="checkbox"/> Solve Problems		<input type="checkbox"/> Interact Effectively with Others	
<u>Communication and Collaboration</u>		<input type="checkbox"/> Work Effectively in Diverse Teams	
<input checked="" type="checkbox"/> Communicate Clearly			
<input type="checkbox"/> Collaborate with Others			

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Computer
- Calculator
- Financial algebra book
- Handout
- Graph paper

Set-Up Required:

- Access to computer

Lab Organization Strategies:

Grouping/Leadership/Presentation Opportunities:

- Individual deadlines for each task

Cooperative Learning:

- none

Expectations:

- students will have a completed grasp of their possibilities for their future

Timeline:

- 2 Days
 - One day for lesson
 - Two days for lab

Post Lab Follow-Up/conclusions:

Discuss real world application of learning from lab

- Does my chosen job match my interests given all the factors identified in the project?

Career Applications

- Find a job

Optional or Extension Activities

- Job shadow
- contact career professional
- can apply to senior portfolio

Washington Applied Math Council

<https://wa-appliedmath.org/>

Financial Algebra 5-3 Lab Commissions & Piecework Pay

Name: _____ Date: _____ Score ____/42

Regular wage, time and a half wage, and double time wage

Using the table below, compute the different wages for each of the five states.

<http://www.dol.gov/whd/minwage/america.htm>

State	Minimum Wage	Time and a Half	Double Time
Washington (3pts)			
Georgia (3pts)			
Kansas (3pts)			
New York (3pts)			
Nevada (3pts)			

What state has the lowest minimum wage? _____ What state has the highest minimum wage? _____

(1pt)

(1pt)

Your Favorite Celebrity Wages, First Year

Washington Teacher, Real Estate Agent and an Uber Driver

You can't decide what you want to do when you grow up. You decide to investigate the wages for your celebrity, a beginning teacher and an Uber driver.

<http://www.forbes.com/celebrities/list/2/#tab:overall>

	Salary per Year	Salary per Month	Salary per Week	Salary per hour (40 hr. week)	Points
Celebrity Name		January			(4pts)
1 st year WA teacher (with 0 years of service and BA+0)	54,000	February 54,000/12	54000/52	54000/(52x40)	(4pts)
Uber Driver		March			(4pts)
Real estate agent		April			(4pts)

Graph the wages of the salaries for a single month for each job. (7pts)

Financial Algebra 5-3 Lab Commissions & Piecework Pay

Your Reflections: (2pts)

Extension:

Washington Applied Math Council

<https://wa-appliedmath.org/>

Financial Algebra 5-3 Lab Commissions & Piecework Pay

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Graph the wages of the salaries for a single month for each job. (7pts)

Financial Algebra 5-3 Lab Commissions & Piecework Pay

Your Reflections: (2pts)

Extension: Present as a power point. Each slide must answer the following questions in complete sentences and must include a different image per slide.

Talk to real estate agent on the breakdown of fees:

What percentage does the agent earn if they list a property? How much goes to the agent and amount goes to their office?

What percentage does the agent earn if they sell a property? How much goes to the agent and amount goes to their office?

Does the percent earned change depending on the price of the home/property?

Does the percent change depend on the type of property? Commercial versus residential.

How has Zillow and or Redfin affected the real estate industry?

Write your own questions.

<https://wa-appliedmath.org/>

WAMC Lesson Plan

Name(s): Penelopy (Popy) Perkins

Email Address: penelopy.perkins@rentonschools.us

Lesson Title: **Commissions, Royalties, & Piecework Pay**

Date: June 25, 2019

Text: Cengage Financial Algebra 2 nd Edition		STEM Correlation:	
Lesson Length: 1 hour			
Big Idea (Cluster): Employment Basics			
Mathematics K–12 Learning Standards: Functions – Interpreting Functions F-LF			
<ul style="list-style-type: none"> - Understand the concept of a function and use function notation - Use function notation, evaluation functions for inputs in their domains, and interpret statements that use function notation in terms of a context. 			
Mathematical Practice(s): Algebra and Functions			
Content Objectives:		Language Objectives (ELL):	
<ul style="list-style-type: none"> - Compute pay based on percent commission - Compute piecework pay 		<ul style="list-style-type: none"> - Explain advantages and disadvantages of pay based on production 	
Vocabulary:		Connections to Prior Learning	
<ul style="list-style-type: none"> - Commission, royalty, pieceworker, piecework rate 		<ul style="list-style-type: none"> - piecewise graphs, percentages, domain and range, algebraic manipulation, decimal and percent equivalents, points of intersection, 	
Questions to Develop Mathematical Thinking:		Common Misconceptions:	
<ul style="list-style-type: none"> • Ask students what they think may be the advantages and disadvantages of piecewise pay compared to straight commission pay 		<ul style="list-style-type: none"> • Piecewise functions are absolute value functions • All piecewise functions are defined for all real numbers 	

Assessment (Formative and Summative):

<ul style="list-style-type: none"> • Students will draw a Venn diagram listing the commonalities and differences between commission and piecewise pay • Student groups will explain what type of employment pays commission and what type of employment uses piecework rate • Students will create examples of how certain occupations pay their workers based on sales and production, not on hours worked. • Use “Extend your understanding as an exit ticket

Materials:

<ul style="list-style-type: none"> • Calculator, packet, graph paper, ruler
--

Instruction Plan:

Launch: Do you want to produce or sell product entry question to class as quick survey. Follow up questions designed to elicit responses concerning pay amounts and pay types when presented with different jobs. Car sales, production software, farm hands, app development, etc.
Explore: Summarize definitions with think pair share, prepare pros and possible attack against their plan.
When I observe students: Discussing the benefits of either plan.
Questions to Develop Mathematical Thinking as you observe: How could you negotiate a better commissions rate? Does this type of pay scale apply to all careers?
Homework: using graphing calculators to graph and find the points of intersection of the following piecewise graph. $X < 12$ $y = .005x$; $y = 0.20x + 2.75$ $13 < x < 50$: $y = .40x + (x-40)(.10)$
Summarize: Which pay method is best for you? Why is the best? What types of careers would be best suited for commission sales, is that the only method to pay them? What career would be best served to be paid in a piecework rate?

Career Application(s):

<ul style="list-style-type: none"> • Real estate agents, farming, manufacturing, factories, journalism • Salary calculations, overtime calculation, business payment plans, finance management, budgeting, personal

WAMC Lesson Plan

budgeting skills.

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

- Global Awareness
 Financial/Economic/Business/Entrepreneurial Literacy
 Civic Literacy
 Health/Safety Literacy
 Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
 Work Creatively with Others
 Implement Innovations

Critical Thinking and Problem

Solving

- Reason Effectively
 Use Systems Thinking
 Make Judgments and Decisions
 Solve Problems

Communication and Collaboration

- Communicate Clearly
 Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS

Information Literacy

- Access and Evaluate Information
 Use and manage Information

Media Literacy

- Analyze Media
 Create Media Products

Information, Communications and Technology (ICT Literacy)

- Apply Technology Effectively

LIFE & CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
 Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
 Work Independently

- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Others
 Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects

- Produce Results

Leadership and Responsibility

- Guide and Lead Others
 Be Responsible to Others

Council

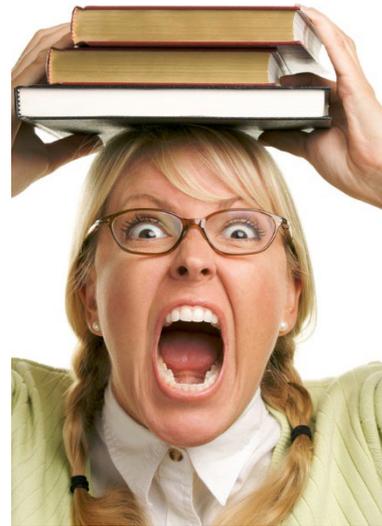
<https://wa-appliedmath.org/>

Commissions, Royalties, and Piecework Pay

<https://www.youtube.com/watch?v=p0GNYsYpdkU>

Commission and Royalty

Pay based on sales



<http://www.ascap.com/members/payment/royalties.aspx>

Pieceworker and Piecework rate

Pay based on items produced



Knowing yourself...

- Would you want to be paid hourly or by commission? Why?
- What advantage could piecework pay be to an employee? The employer?

Example 1

Adrianna wrote a textbook for high school students. She receives a 10% royalty based on the total sales of the book. The book sells for \$47.95, and 17,000 copies were sold last year. How much did Adrianna receive in royalty payments for last year?

■ CHECK YOUR UNDERSTANDING

Xander writes math textbooks that sell for \$80 dollars each. He received a bonus of \$2,500 for signing a contract, and he receives 8% commission on each book sale. What is the total amount of income Xander earns from selling *311,000* books?

Example 2

Allison sells cosmetics part-time from door-to-door. She is paid a monthly commission. She receives 11% of her first \$900 in sales and 17% of the balance of her sales. Last month she sold \$1,250 worth of cosmetics. How much commission did she earn last month?

CHECK YOUR UNDERSTANDING

Arthur sells electronics on commission. He receives 7% of his first $\$1100$ dollars in sales and 10% of the balance of his sales. Last week he sold $\$1500$ dollars worth of electronics. What was the commission he earned last month?

EXAMPLE 3

Kate works in a dress factory that makes dresses for designer boutiques. She is paid a piecework rate of \$85 per unit (piece) produced. Yesterday she made 3 dresses. How much did she earn?

CHECK YOUR UNDERSTANDING

Martin writes magazine articles. He is paid a rate of \$933 dollars for each article he writes. Last year he wrote 38 articles. What was his total piecework earnings?

EXAMPLE 4

Tony picks strawberries and gets paid at a piecework rate of 45 cents per container for the first 200 containers picked. He receives 65 cents per container for every container over 200 that he picks. Last week, Tony picked 270 containers. How much did he earn?

EXAMPLE 5

Glassman Chevrolet pays commission to its car salespeople. They are paid a percent of the **profit** the dealership makes on the car, not on the selling price of the car.

- profit is under \$750, commission rate is 20%.
- profit is at least \$750 and less than or equal to \$1,000, commission rate is 22% of the profit.
- profit is above \$1,000, the rate is 25% of the profit.
- If x represents the profit, express the commission $c(x)$ as a piecewise function.

■ CHECK YOUR UNDERSTANDING

Find the difference between the commission paid if a Glassman Chevrolet salesman sells a car for a \$750 profit compared to selling a car for a \$749 profit.

$$c(x) = \begin{cases} .20x & \text{when } 0 \leq x < 750 \\ .22x & \text{when } 750 \leq x \leq 1000 \\ .25x & \text{when } x > 1000 \end{cases}$$

Let's work through what we've learned

- Pages 307-309
- 2, 5, 6, 10, 14, 24, 20 optional

Try it by yourself

7. p. 324, #7 substitute the following and solve:

- $X = \$50$ (book price)
- $Y = 674$ (books sold)

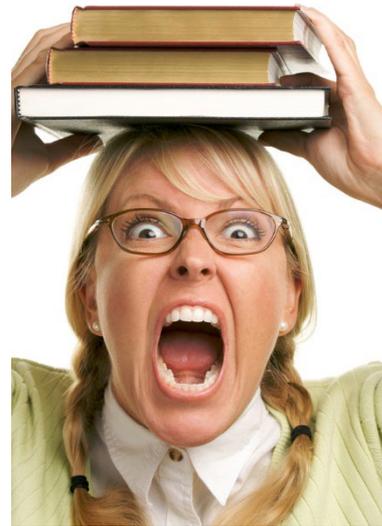
8. p. 324, #8

Commissions, Royalties, and Piecework Pay

6-3

Commission and Royalty

Pay based on sales



<http://www.ascap.com/members/payment/royalties.aspx>

Pieceworker and Piecework rate

Pay based on items produced



Knowing yourself...

- ▶ Would you want to be paid hourly or by commission? Why?
- ▶ If you are a salesperson and a lot, you may want to be paid in commissions
- ▶ What advantage could piecework pay be to an employee? If you are a salesperson and you want a constant pay check then getting a base salary may be better.
- ▶ The employer? If you are an employer, you pay a certain salary regardless if the sales person makes many sales.

Example 1

Adrianna wrote a textbook for high school students. She receives a 10% royalty based on the total sales of the book. The book sells for \$47.95, and 17,000 copies were sold last year. How much did Adrianna receive in royalty payments for last year?

$$17,000 \times 47.95 \times 0.1 = 81515$$

Adrianna receive in \$81515 royalty payments for last year

Example 1 Solution

Adrianna wrote a textbook for high school students. She receives a 10% royalty based on the total sales of the book. The book sells for \$47.95, and 17,000 copies were sold last year. How much did Adrianna receive in royalty payments for last year?

Solution:

Determine the total amount of sales from the 17,000 books.

$$17,000 \times 47.95 = 815,150$$

The total amount of sales is \$815,150.

Multiply the total sales by the commission rate expressed as a decimal.

$$10\% \text{ to decimal. } 10/100 = .10$$

$$815,150 \times .10 = 81,515$$

Adrianna received \$81,515 in royalty payments for the last year.

■ CHECK YOUR UNDERSTANDING

Xander writes math textbooks that sell for \$80 dollars each. He received a bonus of \$2,500 for signing a contract, and he receives 8% commission on each book sale. What is the total amount of income Xander earns from selling 311,000 books?

CHECK YOUR UNDERSTANDING

Xander writes math textbooks that sell for \$80 dollars each. He received a bonus of \$2,500 for signing a contract, and he receives 8% commission on each book sale. What is the total amount of income Xander earns from selling 311,000 books?

Solution:

Determine the total amount of sales from the sale of 311,000 books.

$$310000 \times 80 = 24,800,000$$

The total amount of sales is \$24,800,000

Multiply the total sales by the commission rate expressed as a decimal.

$$8\% \text{ to decimal. } 8/100 = .08$$

$$24,800,000 \times .08 = 1,984,000$$

Add 1,984,000 to signing bonus of 2,500

$$1,984,000 + 2,500 = 1,986,500$$

Xander earned a total income of \$1,986,500.

Example 2

Allison sells cosmetics part-time from door-to-door. She is paid a monthly commission. She receives 11% of her first \$900 in sales and 17% of the balance of her sales. Last month she sold \$1,250 worth of cosmetics. How much commission did she earn last month?

CHECK YOUR UNDERSTANDING Solution

Allison sells cosmetics part-time from door-to-door. She is paid a monthly commission. She receives 11% of her first \$900 in sales and 17% of the balance of her sales. Last month she sold \$1,250 worth of cosmetics. How much commission did she earn last month?

SOLUTION Find the commission on the first \$900 of sales by multiplying 900 by the commission rate expressed as a decimal.

$$900 \times 0.11 = 99.00$$

The commission based on the first \$900 is \$99.

Determine the amount over \$900 by subtracting 900 from total sales.

$$1,250 - 900 = 350$$

The balance over \$900 is \$350.

Multiply 350 by the 17% commission rate expressed as a decimal.

$$350 \times 0.17 = 59.50$$

The commission on the balance of sales over \$900 is \$59.50.

Find the sum of the commission on the first \$900 and the commission on the \$350 balance.

$$99.00 + 59.50 = 158.50$$

The total commission for last month was \$158.50.

■ CHECK YOUR UNDERSTANDING

Arthur sells electronics on commission. He receives 7% of his first \$1100 dollars in sales and 10% of the balance of his sales. Last week he sold \$1500 dollars worth of electronics. What was the commission he earned last month?

CHECK YOUR UNDERSTANDING

Arthur sells electronics on commission. He receives 7% of his first \$1100 dollars in sales and 10% of the balance of his sales. Last week he sold \$1500 dollars worth of electronics. What was the commission he earned last month?

Solution:

$$f(x) = \{.07x + 0.10 (y - x) \text{ when } y > x$$

$$\{0.07x \text{ when } x \geq y$$

- x represents the original sales
- y represents the second amount of sales

$F(x)$ - represents the total amount of money earned.

- $x = 1100$
- $y = 1500$

$$\text{Total earned: } .07 (1100) + .1(1500-1100) = 77 + 40 = 117$$

Arthur earned a total of \$117.00 in commission.

EXAMPLE 3

Kate works in a dress factory that makes dresses for designer boutiques. She is paid a piecework rate of \$85 per unit (piece) produced. Yesterday she made 3 dresses. How much did she earn?

EXAMPLE 3 Solution

Kate works in a dress factory that makes dresses for designer boutiques. She is paid a piecework rate of \$85 per unit (piece) produced. Yesterday she made 3 dresses. How much did she earn?

SOLUTION Multiply the number of pieces, 3, by the piecework rate, which is \$85.

$$3 \times 85 = 255$$

Kate earned \$255 yesterday.

■ CHECK YOUR UNDERSTANDING

Martin writes magazine articles. He is paid a rate of \$933 dollars for each article he writes. Last year he wrote 38 articles. What was his total piecework earnings?

■ CHECK YOUR UNDERSTANDING **Solution**

Martin writes magazine articles. He is paid a rate of \$933 dollars for each article he writes. Last year he wrote 38 articles. What was his total piecework earnings?

Solution:

$$f(a) = p * a$$

- $f(a)$ - represents the total
- p - represents the amount paid per article
- a - represents the amount of articles written
- $f(38) = 933 * 38 = 35454$
- **Martin earned \$35454**

Example 4

Tony picks strawberries and gets paid at a piecework rate of 45 cents per container for the first 200 containers picked. He receives 65 cents per container for every container over 200 that he picks. Last week, Tony picked 270 containers. How much did he earn?

EXAMPLE 4

EXAMPLE 4

Tony picks strawberries and gets paid at a piecework rate of 45 cents per container for the first 200 containers picked. He receives 65 cents per container for every container over 200 that he picks. Last week, Tony picked 270 containers. How much did he earn?

SOLUTION Compute the piecework pay for 200 containers at a rate of 45 cents per container. Then compute the pay for the containers over 200. Add these amounts to find his total pay.

Multiply 200 by piecework pay. $200 \times 0.45 = 90$

Subtract to find the amount picked over the initial 200 containers. $270 - 200 = 70$

Multiply 70 by additional container pay. $70 \times 0.65 = 45.50$

Total pay is the sum of the two amounts. $90.00 + 45.50 = 135.50$

Tony earned \$135.50 in piecework pay last week.

EXAMPLE 5

Glassman Chevrolet pays commission to its car salespeople. They are paid a percent of the profit the dealership makes on the car, not on the selling price of the car.

- ▶ profit is under \$750, commission rate is 20%.
- ▶ profit is at least \$750 and less than or equal to \$1,000, commission rate is 22% of the profit.
- ▶ profit is above \$1,000, the rate is 25% of the profit.
- ▶ If x represents the profit, express the commission $c(x)$ as a piecewise function.

}

EXAMPLE 5 Solution

Glassman Chevrolet pays commission to its car salespeople. They are paid a percent of the profit the dealership makes on the car, not on the selling price of the car.

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Solution:

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CHECK YOUR UNDERSTANDING

Solution

- ▶ **Solution:**
- ▶ - $c(x) = .20x$ $x = 749$
- ▶ - $c(749) = .2(749) = 149.8$
- ▶ - $c(750) = .22(750) = 165$
- ▶ The difference is $165 - 149.8$
- ▶ **Glassman Chevrolet salesperson makes a difference of \$15.20.**

Let's work through what we've learned

▶ Pages 307-309

▶ 2, 5, 6, 10, 14, 24, 20 optional

2a. 5 million

2b. 3.3 million

2c. 8.3 million

2d. \$1,245,000

5. \$1095

6. \$2,435,000

10. \$204.68

14a. \$90.60

14b. \$304

14c. \$394.60

14d. \$304

24a. 25%

24b. 23%

24c. \$223.10

24d. \$255.30

On your own

7. \$4370.00

8. 411

Try it by yourself

7. p. 324, #7 substitute the following and solve:

▶ $X = \$50$ (book price)

▶ $Y = 674$ (books sold)

8. p. 324, #8

7. \$4370.00

8. 411

Quiz: 5.3
Financial Algebra

Name _____

Period _____

Directions: Answer the questions below in the space provided. Show your work to get full points for each answer and label your answers.

1. Juan is a writer who just signed with a publishing company. Juan received an advance to his book of \$80,000. After the book is written he will receive 10% royalty based on the total sales of the book. The book will sell for \$9.99 per hard copy and , \$1.99 per download on a reader.
 - a. In the first release year Juan sold 25,000 hard bound books and 36,000 books were downloaded. What was the total amount of sales (including both hard bound and downloaded sales)?
 - b. How much did Juan receive in royalties last year?

2. The salespeople at Abercrombie and Fitch are paid a commission based on sales. The following piecewise function give the commission rules:
$$c(x) = \begin{cases} 0.2x & \text{when } 0 \leq x < 900 \\ 0.23x & \text{when } 900 \leq x < 1,500 \\ 0.25x & \text{when } x \geq 1,500 \end{cases}$$
 - a. Define the variable, x . What does x represent?
 - b. If the sales are \$1,500, what is the percent commission rate?
 - c. What is the commission on total sales of \$1,800?

3. Sierra is a waitress at a local diner. She earns a base salary of \$10.00 an hour plus commission. She gets 15% of food sales for the first \$250 and 20% on the balance of her food sales.

<https://wa-appliedmath.org/>

a. If x represents food sales, express the commission $c(x)$ as a piecewise function.

b. On a typical 8-hour shift she sells \$325 in food. What would her pay be for that day?

c. Sierra is considering changing jobs to work at the local pizza place. The pizza place doesn't pay commission or tips, only a flat hourly rate of \$14.50.

i. If she works an 8 hour shift, what would her pay be?

ii. Which job pays more for a typical day, the pizza place or the diner?

<https://wa-appliedmath.org/>

Quiz: 6.3
Financial Algebra

Name _____ KEY _____ Period _____

Directions: Answer the questions below in the space provided. Show your work to get full points for each answer and label your answers.

1. Juan is a writer who just signed with a publishing company. Juan received an advance to his book of \$80,000. After the book is written he will receive 10% royalty based on the total sales of the book. The book will sell for \$9.99 per hard copy and , \$1.99 per download on a reader.

- b. In the first release year Juan sold 25,000 hard bound books and 36,000 books were downloaded. What was the total amount of sales (including both hard bound and downloaded sales)?

$$\begin{aligned}25,000 \times 9.99 &= 249,750 \\6,000 \times 1.99 &= 71,640 \\ \text{total sales} &= \$321,390\end{aligned}$$

- c. How much did Juan receive in royalties last year?

$$\begin{aligned}\text{Total sales} &= \$321,390 \\10\% \text{ converts to } &.10 \\ \text{Multiply total sales by } &.1 \\ 321,390 \times .1 &= 32,139.00\end{aligned}$$

Juan received \$32,139.00

- d. How much did Juan earn total from his book?

$$80,000 + 32,139 = 112,139$$

Juan earned a total of \$112,139 from the sale of his book.

2. The salespeople at Abercrombie and Fitch are paid a commission based on sales. The following piecewise function give the commission rules:

$$c(x) = \begin{cases} 0.2x & \text{when } 0 \leq x < 900 \\ 0.23x & \text{when } 900 \leq x < 1,500 \\ 0.25x & \text{when } x \geq 1,500 \end{cases}$$

- a. Define the variable, x . What does x represent?

$x =$ amount of sales

- b. If the sales are \$1,500, what is the percent commission rate?

$$0.23(1,500) = \$345$$

- c. What is the commission on total sales of \$1,800?

$$0.25(1,800) = \$450$$

3. Sierra is a waitress at a local diner. She earns a base salary of \$10.00 an hour plus commission. She gets 15% of food sales for the first \$250 and 20% on the balance of her food sales.

- a. If x represents food sales, express the commission $c(x)$ as a piecewise function.

$$c(x) = \begin{cases} 250(.15) & x \leq 250 \\ 37.5 + 0.20(x - 250) & x > 250 \end{cases}$$

- b. On a typical 8-hour shift she sells \$325 in food. What would her pay be for that day?

$$37.5 + 0.20(325 - 250) = 37.5 + (0.20 \times 75) = 37.5 + 15 = \$52.50 \text{ in commission + pay}$$

$$52.50 + (8 \times 10) = \$132.50$$

- c. Sierra is considering changing jobs to work at the local pizza place. The pizza place doesn't pay commission or tips, only a flat hourly rate of \$14.50.

- i. If she works an 8 hour shift, what would her pay be?

$$8 \times 14.50 = \$116.00$$

- ii. Which job pays more for a typical day, the pizza place or the diner?

The diner.