

Section 5-3

Commissions, Royalties, and Piecework Pay

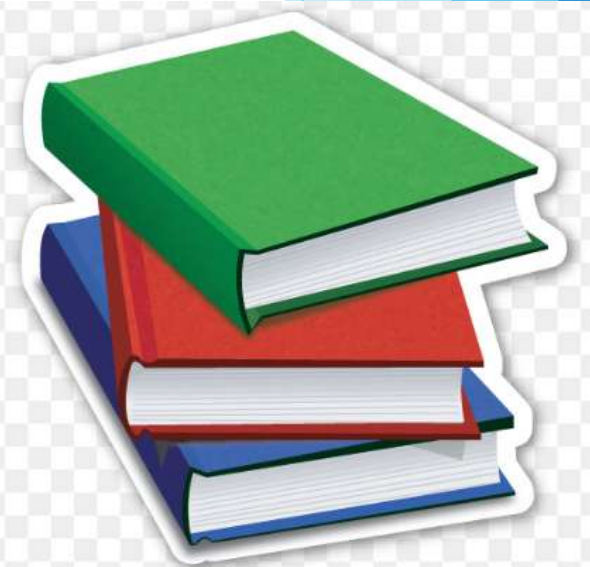
Advanced Financial Algebra

What jobs base their pay according to the amount produced?

- ▶ Some employees are not paid by the number of hours they work, their pay is instead based on the amount of sales they make.
- ▶ Stockbrokers, travel agents, authors, musicians, realtors, and salespersons may all be paid in this way. Their pay is called a commission or a royalty and is usually a percent of sales. What happens if they do not sell anything?
- ▶ Some workers are paid according to the amount of items they produce and these employees are called pieceworkers.
- ▶ They are paid per piece and are sometimes also paid an hourly wage.

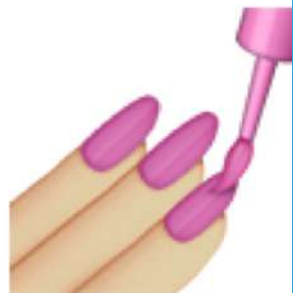
Example 1 - royalties

- ▶ Adrianna wrote a textbook and she receives a 10% royalty based on the total sales of the book which sells for \$47.95 each. 17,000 copies were sold last year. How much did she receive in royalty payments for last year?
- ▶ SOLUTION:
 - ▶ Total \$ sales = 17,000 books * \$47.95 each = \$815,150 in total sales
 - ▶ She gets 10% → $(.10) * \$815,150 = \underline{\$81,515}$ in royalty payments



Example 2 - commission

- ▶ Allison sells cosmetics part time door-to-door and is paid a monthly commission of 11% of her first \$900 in sales and 17% of the remaining sales over \$900. Last month, she sold \$1,250 worth of cosmetics. How much commission did she earn?
- ▶ SOLUTION:
 - ▶ Allison received 11% of her first \$900 = $(.11) * \$900 = \99
 - ▶ How much did she sell over \$900? $\$1,250 - \$900 = \$350$
 - ▶ She receives 17% of this amount = $(.17) * \$350 = \59.50
 - ▶ Total commission = $\$99 + \$59.50 = \underline{\underline{\$158.50}}$



Example 5 - car sales

- ▶ A car dealer usually pays commission to its salespeople based on a percent of the profit the dealership makes on the car, not the selling price.
- ▶ If the profit is under \$750, the rate is 20% at a certain dealership.
- ▶ If the profit is at least \$750 and less than or equal to \$1,000, the rate is 22%.
- ▶ If the profit is above \$1,000, the rate is 25%.
- ▶ Why might a dealer do this?
- ▶ Write a piecewise function to represent one's commission if x is the profit.

▶ SOLUTION:

- ▶ To try to encourage salespeople to sell cars for a higher profit for the dealer.

$$C(x) = \begin{cases} .2x & x < 750 \\ .22x & 750 \leq x \leq 1000 \\ .25x & x > 1000 \end{cases}$$



Example 6 - furniture (working backwards from given commission)

- ▶ Joyce works at Coronado's Furniture. She is paid on commission and receives 10% of her first \$900 in sales and 15% of the balance of her sales. Last week she earned \$750. What was the total value of the furniture she sold?

- ▶ SOLUTION:

- ▶ 10% commission on first \$900 = $(.10) * 900 = \$90$
- ▶ Sales over \$900 = $x - 900$
- ▶ 15 % commission on that amount = $(.15) * (x - 900)$
- ▶ $\$90 + .15(x-900) = \750
- ▶ $90 + .15x - 135 = 750$
- ▶ $.15x - 45 = 750$
- ▶ $.15x = 795$
- ▶ $x = \underline{\$5,300}$ worth of furniture was sold by Joyce last week

add the two commissions

distribute .15

combine like terms

add 45 to both sides

divide both sides by .15

Assignment: pg 311 #2, 3, 9, 11, 13, 19, 22

- ▶ 2. Rock musician Donny West is paid 15% on his tour video online sales. Last year fans downloaded his songs 991,000 times, and he also sold 550,000 videos. The songs are downloaded for \$1.09 each and the videos were downloaded for \$9 each.
- a. What was the total monetary amount of song downloads?
- b. What was the total monetary amount of video downloads?
- c. What was the combined total value of song and video downloads?
- d. How much did Donny West receive in royalties last year?
- ▶ 3. Joan sells new cars at a local dealership. She receives a 25% commission on the profit each car is sold for. Last month she sold 9 cars, for a total of \$8,870 dealer profit. How much did she earn in commission?
- ▶ 9. Hillside Travel pays its employees \$16 per hour plus 8% commission on all trips booked. Tyrus worked 20 hours last week and booked trips amounting to \$2,100. What was his gross pay for last week?
- ▶ 11. Alanna is a stockbroker. She receives a commission based on the value of the trades she makes.
- ▶ a. If Alanna earns \$10 for sales of \$1,000, what is her percent of commission?
- ▶ b. If she earns x dollars for sales of y dollars, express her percent of commission algebraically.

Assignment: pg 311 #2, 3, 9, 11, 13, 19, 22 continued

- ▶ 13. Bill works for the Stuff-It Mailing Service. He receives 25 cents for each document he puts together and prepares for mailing. Last week, Bill prepared 2,000 documents for mailing for a local politician. He received a check with gross pay of \$474 and is certain the amount is incorrect.
- a. What is Bill's correct total piecework pay?
- b. How much does his boss owe him?
- ▶ 19. Appel's Music Store pays its sales staff a commission of 9.5% of the first \$1,000 in sales and 15.5% of the balance of sales. Alex, the store's drum expert, received \$1,234.25 in commission last week. What were his total sales for the week?

Assignment: pg 311 #2, 3, 9, 11, 13, 19, 22 continued

- 22. Salespersons at the Kings Park Auto Giant are paid a commission, $c(p)$, based on the profit, p . The following piecewise function gives the commission rules.

$$c(p) = \begin{cases} 0.20p & \text{when } 0 \leq p < 900 \\ 0.23p & \text{when } 900 \leq p < 1,500 \\ 0.25p & \text{when } p \geq 1,500 \end{cases}$$

- a. If the profit is \$1,500, what is the percent commission rate?
- b. If the profit is \$900, what is the percent commission rate?
- c. What is the commission on a car sold for a \$970 profit?
- d. Kings Park Auto Giant purchases a car for \$32,090 and sells it for \$33,200. What commission is paid to the salesperson?