

# ***LHF STUDY GUIDE* PASS THE HiSET® MATH TEST!**

## **WORD PROBLEMS**

### **Lesson 1 Mixed Word Problems Set A**

Most of the problems in this set involve earnings or costs that are made up of two or three different parts that need to be calculated separately and then added together. Read through the six examples and then do the Practice Questions.

**TIP:** For amounts written as 7 cents or 7¢, you will usually be asked to give an answer in dollars. Be sure to express correctly as money when doing calculations. 7 cents should be written as 0.07, because it is 7 100ths of 1 dollar. It should not be written as 7, which would be 7 dollars, and it should not be written as 0.70, which would be 70 cents. 20 cents should be written as 0.20, because it is 20 100ths of 1 dollar. It should not be written as 20, which would be 20 dollars.

**NOTE:** Multiplication can be expressed by a number next to parentheses or by numbers in parentheses next to each other.

For example:  $\$6(400 - 250)$  is the same as  $\$6 \times (400 - 250)$   
 $(\$25)(\$3.50)$  is the same as  $\$25 \times \$3.50$ .

#### **Example 1**

Shonda earns \$10 per hour at Sneakers Plus. She is also paid a \$2 commission on every pair of sneakers she sells. How much did Shonda earn if she worked 6 hours and sold 9 pairs of sneakers?

- A. \$102            B. \$27            C. \$74            D. \$66            E. \$78

Shonda's earnings have two parts that need to be added together, the hourly pay and the commission pay.

The hourly pay is  $6 \text{ hours} \times \$10 = \$60$ .

The commission pay is  $9 \text{ pairs of sneakers} \times \$2 = \$18$ .

$\$60 + \$18 = \$78$

**Answer: E. \$78**

### Example 2

Samuel's telephone plan costs \$15 per month plus 5 cents for each phone call that is made. If 65 phone calls are made in a month, which expression represents the telephone bill for that month?

- A.  $\$15 + (\$5)(65)$                       B.  $\$15 + 65$                       C.  $65 + (\$0.05)(\$15)$   
D.  $\$15 + (\$0.05)(65)$                       E.  $(\$15)(\$5) + 65$

Note that you need an expression, not a numerical answer.

There are two parts that make up the telephone bill, the monthly fee and the charge for phone calls made, so you need an expression that adds together these two parts.

The monthly fee is \$15.

The charge for phone calls made is 65 calls times 5 cents per call, or,  $(65)(\$0.05)$ .

Add the two parts together.

**Answer: D.  $\$15 + (\$0.05)(65)$**

**NOTE** that 5 cents is written as \$0.05, not \$5.

### Example 3

Salespeople at Rick's Used Cars earn a base pay of \$1,200 per month, plus a \$150 per car commission for the first 10 cars they sell during the month. Any cars beyond 10 that they sell earn a commission that is 2 times the rate for the first 10 cars. What is the total pay for a salesperson that sells 13 cars in a month?

- A. \$3,600      B. \$2,700      C. \$3,150      D. \$1,350      E. \$6,600

The total pay is made up of three different pieces: the base pay, the commission for the first 10 cars sold, and the commission for any cars sold over 10. Calculate each piece and then add them together.

1. Base pay is **\$1,200**.
2. Commission on the first 10 cars is \$150 per car, so  $10 \times \$150 = \mathbf{\$1,500}$ .
3. To get commission for the rest of the cars, you need two pieces of information:
  - 1) The commission rate, which is 2 times the first rate, or  $2 \times \$150 = \$300$  per car.
  - 2) The number of cars that get this rate, which is the total cars sold minus the first 10 cars you have already accounted for, or  $13 - 10 = 3$  cars.Commission on these cars is  $3 \times \$300 = \mathbf{\$900}$ .

Add the three parts together.

$$\$1,200 + \$1,500 + \$900 = \$3,600$$

**Answer: A. \$3,600**

#### **Example 4**

Ace Cable TV pays their Sales Representatives a \$3 commission for each of the first 200 cable plans they sell per month. Any additional plans sold in the same month earn a commission that is 1.5 times the rate for the first 200 plans. If someone sells 812 cable plans in a month, what is the total commission earned that month?

- A. \$2,436      B. \$3,354      C. \$1,218      D. \$2,754      E. \$600

To get total commission, add together two pieces: the commission for the first 200 plans plus the commission for the rest of the plans.

1. The first 200 plans earn \$3 per plan, so  $200 \times \$3 = \mathbf{\$600}$ .
2. To get commission for the rest of the plans, you need two pieces of information:
  - 1) The commission rate, which is 1.5 times the first rate, or  $1.5 \times \$3 = \$4.50$  per plan.
  - 2) The number of plans that get this rate, which is the total plans sold minus the first 200 plans you have already accounted for, or,  $812 - 200 = 612$  plans.  
Commission on these plans is  $612 \times \$4.50 = \$2,754$ .

Add the two pieces together.  $\$600 + \$2,754 = \$3,354$

**Answer: B. \$3,354**

#### **Example 5**

Sue bought a living room furniture set and paid \$2,400 cash. Yolanda also bought a \$2,400 living room set, but instead of paying cash, she used a credit plan. She made a \$600 down payment, and will make payments of \$90 per month for 2 years. How much less did Sue pay than Yolanda?

- A. \$2,160      B. \$2,760      C. \$1,380      D. \$1,610      E. \$360

Calculate how much Yolanda paid, then compare it to the \$2,400 that Sue paid.

Yolanda paid  $\$600 + \$90 \times 24 \text{ months} = \$2,760$ , and the problem tells you Sue paid \$2,400.

$$\$2,760 - \$2,400 = \$360$$

**Answer: E. \$360**

In problems like this, be sure to convert each year to 12 months before multiplying.

**BEWARE** that in multi-step problems like this, the answer to your first calculation, in this case, \$2,760, is not the right answer to the question, but it will usually be one of the multiple choice answers that you are given.

### **Example 6**

Michael's cell phone plan has no monthly charge, but he has to pay 75 cents for each text and \$1.25 for each phone call. In one month there were 22 texts and 30 phone calls. Which expression shows how much his bill will be?

- A.  $\$0.75 + \$1.25 \times 52$       B.  $\$0.75 \times 30 + \$1.25 \times 22$       C.  $\$1.25 \times (22 + 30)$   
D.  $\$0.75 \times 22 + \$1.25 \times 30$       E.  $\$2.00 \times (22 + 30)$

Add together the charge for the texts and the charge for the phone calls.

Charge for texts is 22 texts  $\times$  \$0.75.

Charge for phone calls is 30  $\times$  \$1.25.

**Answer: D.  $\$0.75 \times 22 + \$1.25 \times 30$**

### **Practice – Mixed Word Problems Set A**      *Answers – p. 7*

1. The telephone company charges a monthly fee of \$26.75 plus 7 cents for every phone call made. If 39 phone calls are made in a month, how much will the telephone bill be?

- A. \$299.75      B. \$29.48      C. \$65.75      D. \$33.75      E. \$187.25

2. Juan's cell phone plan charges \$38.50 per month, which includes unlimited texts and 50 phone calls. Any additional phone calls are billed at 22¢ per call. Which of the following expressions represents his cell phone bill in a month where Juan makes 68 phone calls?

- A.  $\$38.50 + (\$0.22)(68)$       B.  $\$38.50 + 50$       C.  $\$38.50 + (\$22)(18)$   
D.  $\$38.50 + (\$0.22)(18)$       E.  $50 \times \$0.22$

3. Janel purchased a laptop computer on a credit plan. Her payments are \$30 per month for 2 years. Mark bought the same laptop, paying \$600 cash. By paying cash, how much money did Mark save?

- A. \$720      B. \$540      C. \$570      D. \$630      E. \$120

4. Life insurance salespeople earn a base pay of \$900 per month plus a \$50 commission for each policy sold. Which expression represents the total monthly pay for a salesman who sells 22 policies in a month?

- A.  $\$900 + \$50$       B.  $\$900 + (\$50)(22)$       C.  $22(\$900 + \$50)$   
D.  $(22)(\$900) + \$50$       E.  $\$950 + 22$

5. Ayala is renting a car that costs \$18 per day plus 10¢ for each mile driven. How much will she pay if she rents the car for 5 days and drives 250 miles?

- A. \$115      B. \$90      C. \$43      D. \$268      E. \$278

6. Lenore earns \$700 base pay plus a \$50 commission per sale for the first 18 alarm systems that she sells each month. Any alarm systems beyond 18 that she sells earn her a commission rate that is 1.5 times the rate for the first 18 alarm systems. How much will Lenore earn in a month where she sells 26 alarm systems?

- A. \$2,000      B. \$2,200      C. \$750      D. \$1,600      E. \$1,402

7. The telephone company charges a monthly fee of \$60 which includes unlimited local calls and 10 long distance calls. Additional long distance calls are billed at 75¢ per call. If Sue makes 48 local calls and 15 long distance calls, what is her bill for the month?

- A. \$71.25      B. \$67.50      C. \$96.00      D. \$75.00      E. \$63.75

8. To rent a car it costs \$35 per day and 15 cents per mile for every mile driven over 300 miles. If Sinya rents a car for 4 days and drives 500 miles, which expression shows how much will it cost to rent the car?

- A.  $\$35 \times 4 + \$15 \times 200$       B.  $\$35 \times 4 + \$0.15 \times 200$   
C.  $\$35 \times 4 + 200$       D.  $\$35 + 4 \times 500$       E.  $\$35 + 300 \times \$0.15$

9. Car salespeople earn \$1,200 per month plus a \$365 commission for every car they sell. If Diane sold 4 cars last month, what were her total earnings?

- A. \$1,565      B. \$5,165      C. \$2,660      D. \$1,569      E. \$4,800

10. Mr. Boden can buy a washer and dryer for \$1,650 cash, or he can make payments of \$85 per month for 2 years. Which expression shows how much he will save by paying cash?

- A.  $(\$85 \times 24) - \$1,650$       B.  $\$1,650 - (\$85 \times 24)$       C.  $(\$85 \times 2) - \$1,650$   
D.  $\$85 + 24 - \$1,650$       E.  $(\$1,650 - \$85) \times 24$

11. Tisha is buying tile to redo her kitchen and dining room floors. Desert Rose tile costs \$12 per square foot, and Tawny Dream tile costs \$10 per square foot. If she needs 250 square feet of tile, which expression shows how much will she save by choosing the less expensive tile?

- A.  $250(\$12 + \$10)$       B.  $250 \times \$10$       C.  $250(\$12 - \$10)$   
D.  $250 + \$12 + \$10$       E.  $(\$12 + 250) - (\$10 + 250)$

12. Angelo can buy a computer for \$700 cash. He can also buy it using the store credit plan where he will have to make a \$200 down payment, and pay \$100 per month for 6 months. How much can Angelo save if he chooses to pay cash?

- A. \$800      B. \$300      C. \$400      D. \$500      E. \$100

**13.** At Couches Unlimited, the first 12 couches sold in a month earn a salesperson a \$50 commission per couch. If any couches over 12 are sold during the month, those couches earn a commission per couch that is 2 times the commission rate for the first 12 couches. If Jay sold 18 couches in March, what was his commission in March?  
A. \$1,200      B. \$900      C. \$2,400      D. \$1,800      E. \$600

**14.** Elisa is having some dental work done, and she can either use the credit plan offered by her dentist, or she can pay \$1,500 cash. With the credit plan, she will make a \$300 down payment and pay \$50 per month for 3 years. How much more will she pay in total if she uses the credit plan instead of paying cash?  
A. \$1,800      B. \$2,100      C. \$600      D. \$450      E. \$300

**15.** One cell phone plan has a base charge of \$42 per month, which includes 300 minutes. All minutes used after the first 300 are charged 2 cents per minute. Which expression shows what the bill is in a month where 750 minutes are used?  
A.  $\$42 + \$0.02(750 - 300)$       B.  $\$42 + \$2(750 - 300)$       C.  $\$42 + \$2(750)$   
D.  $\$42 + \$0.02(750)$       E.  $\$42 + (750 - 300)$

## **ANSWER KEY Lesson 1 Mixed Word Problems Set A**

1. The telephone company charges a monthly fee of \$26.75 plus 7 cents for every phone call made. If 39 phone calls are made in a month, how much will the telephone bill be?

- A. \$299.75      **B. \$29.48**      C. \$65.75      D. \$33.75      E. \$187.25

Add together the monthly charge and the cost for phone calls made.

Monthly charge is \$26.75.

Cost for the phone calls made is 39 calls times 7 cents per call.  $39 \times \$0.07 = \$2.73$ .

$\$26.75 + \$2.73 = \$29.48$

**ANSWER: B. \$29.48**

2. Juan's cell phone plan charges \$38.50 per month, which includes unlimited texts and 50 phone calls. Any additional phone calls are billed at 22¢ per call. Which of the following expressions represents his cell phone bill in a month where Juan makes 68 phone calls?

- A.  $\$38.50 + (\$0.22)(68)$       B.  $\$38.50 + 50$       C.  $\$38.50 + (\$22)(18)$   
**D.  $\$38.50 + (\$0.22)(18)$**       E.  $50 \times \$0.22$

Add together the cost for the monthly charge and the cost for the additional phone calls.

Monthly charge is **\$38.50**.

There are 68 total phone calls and 50 of the calls are free.  $68 - 50 = 18$ , so 18 phone calls will be charged.

Each of these 18 calls is charged at 22¢ per call, so that will be  **$(\$0.22)(18)$** .

Add together the monthly charge plus cost of additional calls.

**ANSWER: D.  $\$38.50 + (\$0.22)(18)$**

3. Janel purchased a laptop computer on a credit plan. Her payments are \$30 per month for 2 years. Mark bought the same laptop, paying \$600 cash. By paying cash, how much money did Mark save?

- A. \$720      B. \$540      C. \$570      D. \$630      **E. \$120**

Calculate the total that Janel will pay, and then subtract the \$600 that Mark paid.

Janel pays \$30 per month for 24 months, so  $\$30 \times 24 = \$720$ .

$\$720 - \$600 = \$120$

**ANSWER: E. \$120**

4. Life insurance salespeople earn a base pay of \$900 per month plus a \$50 commission for each policy sold. Which expression represents the total monthly pay for a salesman who sells 22 policies in a month?

- A.  $\$900 + \$50$                       B.  $\$900 + (\$50)(22)$                       C.  $22(\$900 + \$50)$   
D.  $(22)(\$900) + \$50$                       E.  $\$950 + 22$

Add together base pay plus commission pay.

Base pay is \$900.

Commission is  $\$50 \times 22$  policies.

**ANSWER: B.  $\$900 + (\$50)(22)$**

5. Ayala is renting a car that costs \$18 per day plus 10¢ for each mile driven. How much will she pay if she rents the car for 5 days and drives 250 miles?

- A. **\$115**                      B. \$90                      C. \$43                      D. \$268                      E. \$278

Add together the cost for the number of days and the cost for the miles.

Cost for days is  $\$18 \times 5$  days = \$90.

Cost for miles is  $\$0.10 \times 250$  miles = \$25.

$\$90 + \$25 = \$115$

**ANSWER: A. \$115**

6. Lenore earns \$700 base pay plus a \$50 commission per sale for the first 18 alarm systems that she sells each month. Any alarm systems beyond 18 that she sells earn her a commission rate that is 1.5 times the rate for the first 18 alarm systems. How much will Lenore earn in a month where she sells 26 alarm systems?

- A. \$2,000                      B. **\$2,200**                      C. \$750                      D. \$1,600                      E. \$1,402

Calculate separately then add together three pieces: base pay, commission on the first 18 alarms systems sold, and commission on the rest of the alarm systems sold.

1. Base pay = **\$700**.

2. Commission on the first 18 alarm systems is \$50 each, and  $\$50 \times 18 =$  **\$900**.

3. Commission rate for the rest of the alarm systems is 1.5 times the first rate, or  $1.5 \times \$50 =$  \$75 each.

The alarm systems that get this rate are the total sold minus the 18 already accounted for, or  $26 - 18 = 8$ .

Commission on these alarm systems is  $\$75 \times 8 =$  **\$600**.

Add together the three pieces.  $\$700 + \$900 + \$600 =$  \$2,200

**ANSWER: B. \$2,200**



7. The telephone company charges a monthly fee of \$60 which includes unlimited local calls and 10 long distance calls. Additional long distance calls are billed at 75¢ per call. If Sue makes 48 local calls and 15 long distance calls, what is her bill for the month?
- A. \$71.25      B. \$67.50      C. \$96.00      D. \$75.00      E. **\$63.75**

Add together the monthly fee + cost of local calls + cost of long distance calls.

Monthly fee = **\$60**.

Cost of local calls = **\$0**, because the monthly fee includes unlimited local calls.

Cost of long distance calls is 5 calls x \$0.75 = **\$3.75**.

10 long distance calls are included in the monthly fee, so 15 total long distance calls – 10 free long distance calls = 5 long distance calls that are charged the \$0.75 fee.

$$\$60 + \$0 + \$3.75 = \$63.75$$

**ANSWER: E. \$63.75**

8. To rent a car it costs \$35 per day and 15 cents per mile for every mile driven over 300 miles. If Sinya rents a car for 4 days and drives 500 miles, which expression shows how much will it cost to rent the car?

- A.  $\$35 \times 4 + \$15 \times 200$       B.  **$\$35 \times 4 + \$0.15 \times 200$**   
C.  $\$35 \times 4 + 200$       D.  $\$35 + 4 \times 500$       E.  $\$35 + 300 \times \$0.15$

Add together the rental charge and the mileage charge.

Rental charge is  $\$35 \times 4$  days, or  **$\$35 \times 4$** .

Miles charged are only the miles over the 300 free miles, so,  $500 - 300 = 200$  miles.

These miles are charged 15 cents each, so mileage charge is  **$\$0.15 \times 200$** .

Add the two charges together.

**ANSWER: B.  $\$35 \times 4 + \$0.15 \times 200$**

9. Car salespeople earn \$1,200 per month plus a \$365 commission for every car they sell. If Diane sold 4 cars last month, what were her total earnings?

- A. \$1,565      B. \$5,165      C. **\$2,660**      D. \$1,569      E. \$4,800

Calculate commission earned and add it to the \$1,200 per month.

Commission earned =  $\$365 \times 4$  cars = \$1,460.

$$\$1,200 + \$1,460 = \$2,660$$

**ANSWER: C. \$2,660**

**10.** Mr. Boden can buy a washer and dryer for \$1,650 cash, or he can make payments of \$85 per month for 2 years. Which expression shows how much he will save by paying cash?

- A.  $(\$85 \times 24) - \$1,650$       B.  $\$1,650 - (\$85 \times 24)$       C.  $(\$85 \times 2) - \$1,650$   
D.  $\$85 + 24 - \$1,650$       E.  $(\$1,650 - \$85) \times 24$

Calculate the total cost of the payment plan, and then subtract the cash price.

Payment plan cost is  $\$85 \times 24$  months.

Cash price is \$1,650.

**ANSWER: A.  $(\$85 \times 24) - \$1,650$**

**NOTE** that you subtract the lower cash price from the higher payment plan price, which is answer A, not the other way around, which is answer B.

The amount of money saved is a positive number, not a negative number. If you are trying to decide between answers A and B, calculate both and choose the one that gives a positive answer.

**11.** Tisha is buying tile to redo her kitchen and dining room floors. Desert Rose tile costs \$12 per square foot, and Tawny Dream tile costs \$10 per square foot. If she needs 250 square feet of tile, which expression shows how much will she save by choosing the less expensive tile?

- A.  $250(\$12 + \$10)$       B.  $250 \times \$10$       C.  **$250(\$12 - \$10)$**   
D.  $250 + \$12 + \$10$       E.  $(\$12 + 250) - (\$10 + 250)$

Calculate the savings on 1 square foot of tile by subtracting the lower cost from the higher cost, then multiply the savings  $\times$  250 square feet.

Savings on 1 square foot:  $\$12 - \$10$

Savings on 250 square feet:  $250(\$12 - \$10)$

**ANSWER: C.  $250(\$12 - \$10)$**

**12.** Angelo can buy a computer for \$700 cash. He can also buy it using the store credit plan where he will have to make a \$200 down payment, and pay \$100 per month for 6 months. How much can Angelo save if he chooses to pay cash?

- A. \$800      B. \$300      C. \$400      D. \$500      E. **\$100**

Calculate the higher payment plan price, and subtract the lower cash price.

Cost using payment plan is  $\$200 + (6 \times \$100) = \$800$ .

Cash price is \$700.

$\$800 - \$700 = \$100$

**ANSWER: E. \$100**

**13.** At Couches Unlimited, the first 12 couches sold in a month earn a salesperson a \$50 commission per couch. If any couches over 12 are sold during the month, those couches earn a commission per couch that is 2 times the commission rate for the first 12 couches. If Jay sold 18 couches in March, what was his commission in March?

- A. **\$1,200**      B. \$900      C. \$2,400      D. \$1,800      E. \$600

Calculate separately the commission for the first 12 couches, and the commission for the rest of the couches, and then add the two commissions together.

1. Commission for the first 12 couches is \$50 per couch, so  $\$50 \times 12 = \mathbf{\$600}$ .
2. Commission for the rest of the couches is 2 times the first rate, or  $2 \times \$50 = \$100$  per couch. There are  $18 - 12 = 6$  couches at this rate, and  $\$100 \times 6 = \mathbf{\$600}$ .

Add together both commissions.  $\$600 + \$600 = \$1,200$

**ANSWER: A. \$1,200**

**14.** Elisa is having some dental work done, and she can either use the credit plan offered by her dentist, or she can pay \$1,500 cash. With the credit plan, she will make a \$300 down payment and pay \$50 per month for 3 years. How much more will she pay in total if she uses the credit plan instead of paying cash?

- A. \$1,800      B. \$2,100      C. **\$600**      D. \$450      E. \$300

Calculate the total paid using the credit plan, and subtract the \$1,500 cash price.

Credit plan cost is  $\$300 + \$50 \times 36 \text{ months} = \$2,100$ .

$\$2,100 - \$1,500 = \mathbf{\$600}$

**ANSWER: C. \$600**

**15.** One cell phone plan has a base charge of \$42 per month, which includes 300 minutes. All minutes used after the first 300 are charged 2 cents per minute. Which expression shows what the bill is in a month where 750 minutes are used?

- A.  **$\$42 + \$0.02(750 - 300)$**       B.  $\$42 + \$2(750 - 300)$       C.  $\$42 + \$2(750)$   
D.  $\$42 + \$0.02(750)$       E.  $\$42 + (750 - 300)$

Add together the charge for minutes used and the \$42 per month charge.

The 2 cents per minute charge is for minutes over 300, so it applies to  $750 - 300$  minutes, so the minutes used charge is  $\$0.02(750 - 300)$ .

Add to the \$42 monthly charge.

**ANSWER: A.  $\$42 + \$0.02(750 - 300)$**