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Basic Arithmetic Study Guide & Sample Test Questions Version 3



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WELCOME

Thank you for your interest in employment with the County of Los Angeles. This guide is designed to familiarize and assist you with preparing for examinations containing multiple-choice basic arithmetic items. The sample questions provided in this study guide are intended to give you an idea of the kinds of basic arithmetic items you may encounter in County tests. However, it is important to note that actual test questions will vary in format, content, and level of difficulty, depending on the job class being tested.

ABOUT THE COUNTY'S EXAMINATIONS

As an Equal Opportunity Employer, the County of Los Angeles takes steps to ensure that our exam content is job-related. We conduct studies to determine the knowledge, skills, abilities and personal characteristics that are essential to satisfactorily perform the duties of the job. These studies assist us in developing the content of our examinations. Testing applicants for jobs provides us with an objective and cost-effective means to assess the qualifications of our applicants.

HOW SHOULD I PREPARE FOR THE WRITTEN TEST?

To prepare for the written test, you should study the concepts assessed in each section. It is likely that there will be several sections to the written test in addition to arithmetic; thus, it is to your benefit to carefully read the job bulletin to determine the knowledge, skill, and ability areas the written test will cover. In addition, it is important that you read the entire written test notice for the location and time of the written test as well as for parking instructions and other important information. Pay special attention to whether testing aids/materials such as handheld calculators are allowed in the written test. If the test notice indicates that testing aids/materials are allowed, then you are strongly advised to bring these with you, as they will not be provided. On the test day, it is recommended that you arrive 15 minutes prior to the test's starting time, wear comfortable clothes, bring an accurate watch, and make sure you are well-rested. Also, remember to bring your test notice and a picture I.D. such as a driver license, or you may not be admitted into the test!

NOTE: Applicants who require special testing arrangements such as readers or interpreters must provide seven (7) days advance notice of their disability and requested accommodation. Check the front side of the job bulletin for telephone numbers to call and make disability accommodation requests. The County will attempt to meet reasonable accommodation requests whenever possible.

TEST-TAKING TIPS

Most County examinations have a set time limit, so it is important that you work quickly, but not so fast as to become careless. Always read all the possible choices before selecting your answer. If you do not know the answer to a problem, it is usually best to skip it and move on to the others. Note that on most County examinations, your score is based on the number of correct responses. If you are not sure of the answer to a problem, eliminate the answers you believe are wrong, and mark the choice that is your best response. Above all, budget your time, pace yourself, and avoid getting bogged down on any single question.

SAMPLE BASIC ARITHMETIC QUESTIONS

Basic arithmetic items test your knowledge of, and ability to interpret and solve problems of a mathematical nature, using such operations as addition, subtraction, division, and multiplication, and in a variety of problem formats and situations. However, actual problems will vary from one test to another. For example, a test problem may require you to calculate the totals in a supply budget, much like you may be asked to do in the position for which you are testing. The following are examples of the types of basic arithmetic problems most common to County examinations. Answers and explanations for the problems begin on page 8 of this study guide. A glossary of mathematical terms has also been included on page 7 for your reference.

1. $11.700 - 5.278 =$

- A. 6.342
- B. 6.422
- C. 7.342
- D. 6.432

2.
$$\begin{array}{r} 526 \\ \times 213 \\ \hline \end{array}$$

- A. 112,038
- B. 113,038
- C. 113,288
- D. 114,038

3. $2568 \div 12 =$

- A. 212
- B. 213
- C. 214
- D. 215

4.
$$\begin{array}{r} 5 \text{ feet, } 4 \text{ inches} \\ 7 \text{ feet, } 8 \text{ inches} \\ 12 \text{ feet, } 9 \text{ inches} \\ + 15 \text{ feet} \\ \hline \end{array}$$

- A. 39 feet, 20 inches
- B. 39 feet, 22 inches
- C. 40 feet, 8 inches
- D. 40 feet, 9 inches

5. 9 days, 5 hours, 48 minutes
 7 days, 15 hours, 9 minutes
 + 3 days, 13 hours, 13 minutes
- A. 19 days, 13 hours, 40 minutes
 B. 19 days, 12 hours, 30 minutes
 C. 20 days, 11 hours, 20 minutes
 D. 20 days, 10 hours, 10 minutes
6. 80% of 35 =
- A. 26
 B. 27
 C. 28
 D. 29
7. A local city applies a 5.5% tax to utility usage charges when issuing residential utility bills. What is the amount of tax that is applied to a \$178.00 utility usage charge?
- A. \$5.34
 B. \$9.79
 C. \$14.13
 D. \$15.13
8. A pallet shipment has been received in a warehouse. If six boxes fit into one crate and ten crates fit onto one pallet, how many boxes are on one pallet?
- A. 60
 B. 66
 C. 600
 D. 660
9. The mailroom's automatic folding machine can fold 7,500 pages per hour. How long will it take for the machine to fold a 6-page letter for a mass mailing to 625 individuals?
- A. 20 minutes
 B. 30 minutes
 C. 45 minutes
 D. 50 minutes
10. An employee's monthly income is \$3,509.00. If the employee receives a salary increase of 4%, what is her new monthly salary?
- A. \$2,649.36
 B. \$2,694.36
 C. \$3,649.36
 D. \$3,694.36

11. In a Social Services Agency, each of the 9 employees on a team is required to process 12 cases per day. On a particular day, one employee calls in sick and two others are on vacation. Provided the cases are distributed equally among the remaining team members, how many cases will each team member have to process to meet the daily required number of cases?
- A. 12
 - B. 18
 - C. 20
 - D. 24
12. Last year, a department spent \$8,300 for office equipment. This year, it will spend 5 percent less. How much will it spend this year?
- A. \$6,640
 - B. \$6,965
 - C. \$7,730
 - D. \$7,885
13. A room that was originally 12' x 14' was increased to 15' x 20'. How many square feet of floor space were added?
- A. 112
 - B. 118
 - C. 128
 - D. 132
14. An employee's gross salary is \$950.00 per week. From his salary, 12% is deducted for federal taxes; 9% for state taxes; and 4% for health insurance premiums. If all of these deductions are taken as a percent of his salary, what is his net income for a four-week period?
- A. \$2,600.00
 - B. \$2,825.00
 - C. \$2,850.00
 - D. \$2,950.00
15. 2,125 employees work in a department. Each employee works 40 hours per week. What is the total number of hours worked by these employees in a 4-week period?
- A. 260,000
 - B. 280,000
 - C. 310,000
 - D. 340,000

16. A case of bottles of isopropyl alcohol used in a hospital weighs 17.3 pounds. What would 6 cases weigh?
- A. 101.8 pounds
 - B. 102.8 pounds
 - C. 103.8 pounds
 - D. 104.8 pounds
17. An hourly employee earns \$774.00 by working 36 hours per week. He receives a raise that provides a 2% increase in his hourly salary. If after receiving the raise he reduces the number of hours that he works to 34, what would be his new weekly salary?
- A. \$745.62
 - B. \$754.82
 - C. \$781.90
 - D. \$791.09
18. A warehouse employee was instructed to stock 48 boxes. If each shelf in the warehouse can hold 10 boxes, how many shelves will the employee need to stock all of the boxes?
- A. 4
 - B. 5
 - C. 6
 - D. 7
19. A group of six employees working a reception window screen 24 clients in one hour. If each employee screens an equal number, how many clients will each employee screen in 8 hours?
- A. 32
 - B. 34
 - C. 36
 - D. 38
20. Since January 1 of last year, a community center began receiving a federal subsidy of \$15,000 for every 300 clients it serves. If the center served 2,700 clients last year and 600 clients so far this year, what is the total amount of federal assistance that the center has received to date?
- A. \$120,000
 - B. \$135,000
 - C. \$150,000
 - D. \$165,000

GLOSSARY OF MATHEMATICAL TERMS

Area:	The number of square units that covers a shape or figure.
Denominator:	The bottom part of a fraction. (Example: in the fraction $\frac{3}{4}$, 4 is the denominator.)
Digit:	The ten numerals 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The number 14 has two digits: 1 and 4.
Difference:	The result of subtracting one number from another.
Divisor:	In a division problem, the number that is divided into another (For example when dividing 4 into 20, the 4 would be the divisor, as it is used to divide the number 20 into five parts).
Factor:	One of two or more numerical values that are multiplied together to yield a product.
Fraction:	A number expressed in terms of a numerator and denominator.
Least Common Multiple:	The smallest, non-zero multiple of the denominators of two or more fractions.
Numerator:	The top part of a fraction. (Example, in the fraction $\frac{3}{4}$ 3 is the numerator).
Operation:	Any one of the basic arithmetic functions of addition, subtraction, multiplication, or division.
Product:	The result of two numbers being multiplied together.
Quotient:	The result of dividing one number into another.
Sum:	The result of adding together two or more numbers.

ANSWERS AND EXPLANATIONS TO ARITHMETIC SAMPLE QUESTIONS

NOTE: Typically, there are multiple ways of obtaining the correct answer to each question, only one of which is provided as the answer explanation. Use the glossary on page 7 to help you define any terms with which you may be unfamiliar.

1. **Correct Answer: B**

- Set up the problem by lining up numbers vertically, aligning all decimal points (Step # 1).
- Working right to left, set up the problem for solving by carrying values over only when the top value for a column is less than its bottom value (Step #2).
- Subtract all values to determine the difference (Step #3).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>
$\begin{array}{r} 11.700 \\ - 5.278 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 10.7\mathbf{00} \\ - 5.278 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ 10.7\mathbf{00} \\ - 5.278 \\ \hline 6.422 \end{array}$

2. **Correct Answer: A**

- Working from right to left, multiply 526 by each digit in the factor "213" separately. You may wish to add zero placeholders (shown in bold) to help ensure that columns are aligned correctly (Step #1).
- Add the products from Step #1 to arrive at the correct answer (Step #2).

<u>STEP #1</u>	<u>STEP #2</u>
$\begin{array}{r} 526 \\ \times 213 \\ \hline 1578 \\ 526\mathbf{0} \\ 1052\mathbf{00} \end{array}$	$\begin{array}{r} 526 \\ \times 213 \\ \hline 1578 \\ 526\mathbf{0} \\ + 1052\mathbf{00} \\ \hline 112038 \end{array}$

3. **Correct Answer: C**

- Set up the problem by placing the number to be divided (2568) inside the bar and the divisor (12) to the left of the vertical bar (Step #1).
- Determine how many times 25 can be divided by 12 and place the number (2) over the 25. Multiply the number (2) by the divisor (12) and subtract the result (24) from the number divided (25) to equal the remainder 1 (Step #2).
- Carry down the next digit in 2568 (6) by placing it next to the remainder from Step #2, to equal 16 (Step #3).
- Repeat Step #2 and Step #3 until all the possibilities of division have been exhausted and there are no other numbers to be divided (Step #4).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>	<u>STEP #4</u>
$12 \overline{) 2568}$	$\begin{array}{r} 2 \\ 12 \overline{) 2568} \\ \underline{-24} \\ 1 \end{array}$	$\begin{array}{r} 2 \\ 12 \overline{) 2568} \\ \underline{-24} \\ 16 \end{array}$	$\begin{array}{r} 214 \\ 12 \overline{) 2568} \\ \underline{-24} \\ 16 \\ \underline{-12} \\ 48 \\ \underline{-48} \\ 0 \end{array}$

4. **Correct Answer: D**

- Add the measurements in the inches column, for a total of 21 inches (Step #1).
- Since 12 inches equals 1 foot, convert the 21 inches into 1 foot, 9 inches; carry the 1 foot into the feet measurement column; and sum (Step #2).

<u>STEP #1</u>	<u>STEP #2</u>
$\begin{array}{r} 5 \text{ feet, } 4 \text{ inches} \\ 7 \text{ feet, } 8 \text{ inches} \\ 12 \text{ feet, } 9 \text{ inches} \\ + 15 \text{ feet, } \\ \hline 21 \text{ inches} \end{array}$	$\begin{array}{r} 1 \text{ foot} \\ 5 \text{ feet, } 4 \text{ inches} \\ 7 \text{ feet, } 8 \text{ inches} \\ 12 \text{ feet, } 9 \text{ inches} \\ + 15 \text{ feet, } \\ \hline 40 \text{ feet, } 9 \text{ inches} \end{array}$

5. **Correct Answer: D**

- Add the measurements in the minutes column for a total of 70 minutes (Step #1).
- Since 60 minutes equals 1 hour, convert the 70 minutes into 1 hour, 10 minutes; carry the 1 hour into the hours measurement column; and sum for a total of 34 hours, 10 minutes (Step #2).
- Since 24 hours equals 1 day, convert the 34 hours into 1 day, 10 hours; carry the 1 day into the days measurement column; and sum for a total of 20 days (Step #3).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>
9 days, 5 hours, 48 minutes 7 days, 15 hours, 9 minutes + 3 days, 13 hours, 13 minutes <hr style="width: 100%;"/> 70 minutes	^{1 hour} 9 days, 5 hours, 48 minutes 7 days, 15 hours, 9 minutes + 3 days, 13 hours, 13 minutes <hr style="width: 100%;"/> 34 hours, 10 minutes	^{1 day} ^{1 hour} 9 days, 5 hours, 48 minutes 7 days, 15 hours, 9 minutes + 3 days, 13 hours, 13 minutes <hr style="width: 100%;"/> 20 days, 10 hours, 10 minutes

6. **Correct Answer: C**

- Multiply 35 by the decimal equivalent of 80% (.8) and insert the decimal point in the product one place from the right, as the factors 35 and .8 have a total of one decimal place (Step #1).

STEP #1

$$\begin{array}{r}
 35 \\
 \times .8 \\
 \hline
 28.0
 \end{array}$$

7. **Correct Answer: B**

- Multiply \$178.00 by the decimal equivalent of 5.5% (.055) to determine the amount of tax that will be applied. Insert the decimal point in the product three places from the right, as the factors 178 and .055 have a total of three decimal places (Step #1).

STEP #1

$$\begin{array}{r}
 178 \\
 \times .055 \\
 \hline
 890 \\
 890 \\
 +000 \\
 \hline
 9790
 \end{array}$$

\$9.79

8. **Correct Answer: A**

- Multiply the number of boxes in a crate (6) by the number of crates on the pallet (10) to determine that there are 60 boxes on one pallet (Step #1).

STEP #1

$$\begin{array}{r} 10 \\ \times 6 \\ \hline 60 \end{array}$$

9. **Correct Answer: B**

- Multiply the number of individuals who will receive the letter (625) by the number of pages in the letter (6) to determine that 3,750 sheets need to be folded (Step #1).
- Divide the number of pages that can be folded per hour (7,500) by the number of minutes in one hour (60) to determine that 125 sheets can be folded per minute (Step #2).
- Divide the number of sheets that need to be folded (3,750) by the number of sheets that can be folded per minute (125) to determine that it will take the machine 30 minutes to fold the letters (Step #3).

STEP #1

$$\begin{array}{r} 625 \\ \times 6 \\ \hline 3750 \end{array}$$

STEP #2

$$\begin{array}{r} 125 \\ 60 \overline{) 7500} \\ \underline{-60} \\ 150 \\ \underline{-120} \\ 300 \\ \underline{-300} \\ 0 \end{array}$$

STEP #3

$$\begin{array}{r} 30 \\ 125 \overline{) 3750} \\ \underline{-375} \\ 00 \end{array}$$

10. **Correct Answer: C**

- Multiply \$3509 by the decimal equivalent of 4% (.04). Insert the decimal point in the product two places from the right, as the factors 3509 and .04 have a total of two decimal places (Step #1).
- Add the product from Step #1 to the employee's previous salary to determine the new salary (Step #2).

STEP #1

$$\begin{array}{r} 3509 \\ \times .04 \\ \hline 14036 \\ +0000 \\ \hline 14036 \end{array}$$

\$140.36

STEP #2

$$\begin{array}{r} \$3509.00 \\ + \$ 140.36 \\ \hline \$3649.36 \end{array}$$

11. **Correct Answer: B**

- Multiply the number of cases each employee processes by the number of employees on the team to determine the total number of cases that must be processed per day (Step #1).
- Subtract the number of employees who are sick and on vacation from the total number on the team to determine the number of employees present to process cases on the particular day (Step #2).
- Divide the number of cases that must be processed by the number of employees present to determine how many cases each must process on the particular day (Step #3).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>
12	9 employees	$\overline{)18}$
$\times 9$	<u>-1 sick</u>	$\overline{)108}$
<u>108</u>	8 employees	<u>- 6</u>
	<u>-2 on vacation</u>	48
	6 employees	<u>- 48</u>
		0

12. **Correct Answer: D**

- Multiply 8,300 by the decimal equivalent of 5% (.05) to determine the amount of decrease in equipment expenditures this year. Insert the decimal point in the product two places from the right, as the factors 8300 and .05 has a total of two decimal places (Step #1).
- Subtract the product from Step #1 from the amount spent last year to determine the amount that will be spent on equipment this year (Step #2).

<u>STEP #1</u>	<u>STEP #2</u>
8300	\$8300.00
$\times .05$	<u>- \$ 415.00</u>
<u>41500</u>	\$7885.00
<u>+0000</u>	
41500	
\$415.00	

13. **Correct Answer: D**

- Find the total area of both the original room and the enlarged room (Step #1). The formula for area is $A = L \times W$, where $A = \text{area}$; $L = \text{length}$; and $W = \text{width}$. The product is expressed in square feet.
- Subtract the area of the original room from the area of the enlarged room to determine the amount of floor space that was added (Step #2).

STEP #1

Original room measurement: $12' \times 14' = 168$

Enlarged room measurement: $15' \times 20' = 300$

STEP #2

$300 - 168 = 132$ square feet

14. **Correct Answer: C**

- Add the decimal equivalent of the federal tax, state tax, and insurance deductions to determine the total percent deduction (Step #1).
- Multiply the employee's gross weekly salary by 4 to determine his gross salary for a four-week period. Insert the decimal point in the product two places from the right, as the factors 950.00 and 4 have a total of two decimal places (Step #2).
- Multiply the product from above by the decimal equivalent of the total percent deduction to determine the amount that is deducted for a four-week period. Insert the decimal point in the product two places from the right, as the factors 3800 and .25 have a total of two decimal places (Step #3).
- Subtract the product from above from the employee's gross four-week income to determine his net income for a four-week period (Step #4).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>	<u>STEP #4</u>
12%	\$ 950.00	\$3800	\$3800.00
9%	$\times \quad 4$	$\times \quad .25$	$-\$ 950.00$
$\underline{+ 4\%}$	$\underline{\$3800.00}$	19000	$\underline{\$2850.00}$
25%		$\underline{+7600}$	
		95000	
		\$950.00	

15. **Correct Answer: D**

- Multiply the total number of employees (2,125) by the weekly number of hours each employee works (40) to determine that there are 85,000 hours worked in one week (Step #1).
- Multiply 85,000 by 4 to determine that there are 340,000 hours worked in a 4-week period (Step #2).

<u>STEP #1</u>	<u>STEP #2</u>
$\begin{array}{r} 2125 \\ \times 40 \\ \hline 0000 \\ +8500 \\ \hline 85000 \end{array}$	$\begin{array}{r} 85000 \\ \times 4 \\ \hline 340000 \end{array}$

16. **Correct Answer: C**

- Multiply the weight of one case (17.3) by 6 to determine the weight of 6 cases. Insert the decimal point in the product one place from the right, as the factors 17.3 and 6 have a total of one decimal place (Step #1).

STEP #1

$$\begin{array}{r} 17.3 \\ \times 6 \\ \hline 103.8 \end{array}$$

17. **Correct Answer: A**

- Divide the employee's original weekly earnings by 36 to determine his hourly salary before the promotion (Step #1).
- Multiply the hourly salary before the promotion by the decimal equivalent of 2% to determine the amount of the salary increase. Insert the decimal point in the product four places from the right, as the factors 21.50 and .02 have a total of four decimal places (Step #2).
- Add the product from Step #2 to the hourly salary before the raise to determine the new hourly salary after the raise (Step #3).
- Multiply the new hourly salary by 34 to determine the employee's weekly salary if he reduces his hours. Insert the decimal point in the product two places from the right, as the factors 24.08 and 34 have a total of two decimal places (Step #4).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>	<u>STEP #4</u>
$\begin{array}{r} 21.5 \\ 36 \overline{) 774.00} \\ \underline{-72} \\ 54 \\ \underline{-36} \\ 18.0 \\ \underline{-18.0} \\ 0 \end{array}$	$\begin{array}{r} \$21.50 \\ \times .02 \\ \hline 4300 \\ +0000 \\ \hline 04300 \end{array}$	$\begin{array}{r} \$21.50 \\ + \$ 0.43 \\ \hline \$21.93 \end{array}$	$\begin{array}{r} \$21.93 \\ \times 34 \\ \hline 8772 \\ +6579 \\ \hline 74562 \end{array}$
	\$0.43		\$745.62

18. **Correct Answer: B**

- Divide the number of boxes that need to be stocked (48) by the number of boxes that each shelf can hold (10) to determine how many shelves will be needed (Step #1).
- Since 4 total shelves and part of 1 other shelf will be required, 5 shelves will be needed to stock all of the boxes.

STEP #1

$$\begin{array}{r} 4.8 \\ 10 \overline{) 48.0} \\ \underline{-40} \\ 8.0 \\ \underline{-8.0} \\ 0 \end{array}$$

19. **Correct Answer: A**

- Multiply the number of clients that can be screened in one hour (24) by 8 to determine the number of clients that can be screened in 8 hours (Step #1).
- Divide the product from Step #1 by the number of employees in the group (6) to determine the number of clients each will screen in 8 hours (Step #2).

STEP #1 STEP #2

$$\begin{array}{r} 24 \\ \times 8 \\ \hline 192 \end{array} \qquad \begin{array}{r} 32 \\ 6 \overline{) 192} \\ \underline{-18} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

20. **Correct Answer: D**

- Determine how many clients the center has served since it began receiving federal assistance by adding the number of clients served last year (2700) with the number served so far this year (600), for an answer of 3300 (Step #1).
- Divide 3300 by 300 to determine how many times the center served enough clients to receive the federal subsidy, for an answer of 11 times (Step #2).
- Multiply the number of times the subsidy was earned (11) by the amount of the assistance (\$15,000) to determine that the center has earned \$165,000 to date (Step #3).

<u>STEP #1</u>	<u>STEP #2</u>	<u>STEP #3</u>
$\begin{array}{r} 2700 \\ + 600 \\ \hline 3300 \end{array}$	$\begin{array}{r} 11 \\ 300 \overline{) 3300} \\ \underline{-300} \\ 300 \\ \underline{-300} \\ 0 \end{array}$	$\begin{array}{r} \$15000 \\ \times 11 \\ \hline 15000 \\ +150000 \\ \hline 165000 \end{array}$