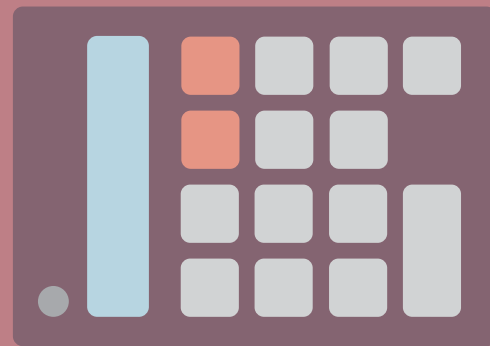




MATH

Student Book



► **5th Grade**

MATH 501

PLACE VALUE, ADDITION, AND SUBTRACTION

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MULTIPLYING WHOLE NUMBERS AND DECIMALS

In this unit, students will explore multiplication with whole numbers and decimal numbers. They will use estimation, grids, the properties of multiplication, and pencil and paper to find products. In addition, they will study exponents and powers of ten. They will learn how to multiply whole numbers and decimals by powers of ten. Finally, they will apply their multiplication skills to solve one- and two-step word problems.

Objectives

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAAC. When you have finished this LIFEPAAC, you should be able to:

- Estimate whole number and decimal products.
- Use the properties of multiplication.
- Multiply whole numbers and decimals by powers of ten.
- Multiply whole numbers and decimal numbers.
- Solve multiplication word problems.

Review: Basic Math Facts

As we saw in the cartoon, multiplication is just repeated addition. Nutmeg and Pepper had two different ways to find the same answer.

Pepper: $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$ Adding 5 eight times.

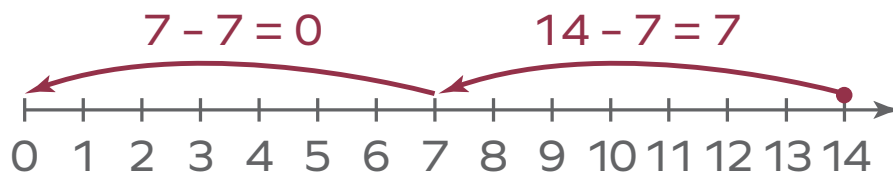
Nutmeg: $5 \times 8 = 40$ Multiplying 5 and 8.

Both methods get the same result, but multiplying is usually much faster (and takes less bark!). Nutmeg's answer is called a **product**. A product is the result of multiplying two or more numbers, which are called **factors**. You're probably very good at finding the product of two factors that are each 12 or less. Take a look at the following multiplication table to help you review your math facts.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Example:

What division problem is modeled?

**Solution:**

The model shows repeated subtraction on a number line. Seven is subtracted from 14, two times. So, the division problem is $14 \div 7 = 2$. The dividend is 14, the divisor is 7, and the quotient is 2.

Division as the Opposite of Multiplication

Still another way to think about division is as the opposite of multiplication. Multiplication and division are opposite operations that undo each other. They are called **inverse operations**.

Let's review the division problems we've looked at so far. Each division fact also has a multiplication fact. The quotient can be multiplied by the divisor to get the dividend:

Keep in mind...

Addition and subtraction is another example of inverse operations.

DIVISION FACT	MULTIPLICATION FACT
$20 \div 5 = 4$	$4 \times 5 = 20$
$18 \div 6 = 3$	$3 \times 6 = 18$
$14 \div 7 = 2$	$2 \times 7 = 14$

Because multiplication and division are opposites, we can use multiplication to help us solve division problems and check our answers.

Example:

Divide.

$$72 \div 9$$

Solution:

$$72 \div 9 = 8$$

Since $8 \times 9 = 72$, our quotient is correct.

Key point!

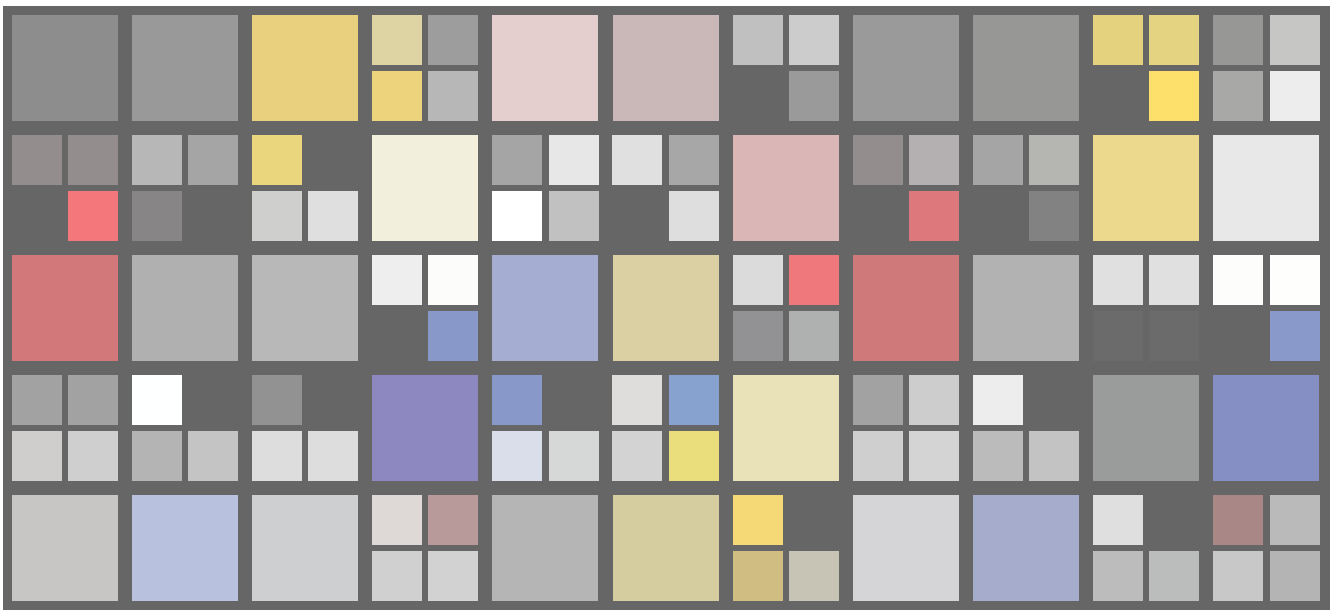
One way to divide is to use multiplication facts. Ask yourself: "What number can be multiplied by the divisor to get the dividend?" The number answering that question is the quotient.

- 1.11** Which of the following lists all the factors of 36?
- a. 1, 2, 3, 4, 6, 12, 36 b. 1, 2, 3, 4, 5, 6, 7, 9, 12, 36
- c. 2, 3, 4, 6, 9 d. 1, 2, 3, 4, 6, 9, 12, 36
- 1.12** Which of the following numbers is 20 divisible by? (There may be more than one correct answer.)
- a. 2 b. 3 c. 4 d. 5
- e. 6 f. 9 g. 10



Complete these activities.

- 1.13** List all the factors of 56. Tell whether 56 is prime or composite.
- Factors: _____
- Prime or composite? _____
- 1.14** List all the factors of 15. Tell whether 15 is prime or composite.
- Factors: _____
- Prime or composite? _____
- 1.15** List all the factors of 19. Tell whether 19 is prime or composite.
- Factors: _____
- Prime or composite? _____



What did you notice in both problems about adding fractions? The numerators were added together, and the denominator stayed the same. Here's another example:

Example:

Kari ate $\frac{3}{12}$ of the pizza, Sam ate $\frac{4}{12}$ of the pizza, and Kristi ate $\frac{1}{12}$ of the pizza. How much did they eat altogether?

Solution:

To find the total amount that they ate, add the fractions together. The fractions have **like denominators**, so add the numerators and keep the denominator the same.

$$\frac{3}{12} + \frac{4}{12} + \frac{1}{12} = \frac{8}{12}$$

Notice that $\frac{8}{12}$ is not written in simplest form. 8 and 12 have a common factor of 4.

$$\frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

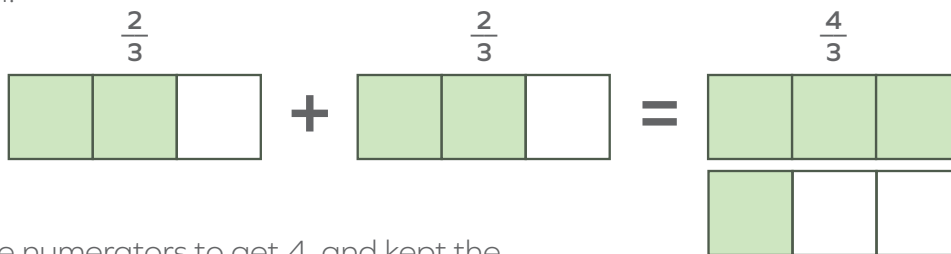
Kari, Sam, and Kristi ate $\frac{2}{3}$ of the pizza altogether.



S-T-R-E-T-C-H...

What fraction of the pizza is left over?

Sometimes, the sum of two or more fractions is greater than 1. For example, let's add $\frac{2}{3}$ and $\frac{2}{3}$, using a model.



We added the numerators to get 4, and kept the denominators the same. Notice that the sum ($\frac{4}{3}$) is an improper fraction. Another way to write an improper fraction is as a mixed number. As you can see from the model, $\frac{4}{3}$ is the same as $1\frac{1}{3}$.

Remember, to add fractions with like denominators, add the numerators together and keep the denominator the same. Then, write the sum as a fraction or mixed number in simplest form.

This might help...

Remember that to convert an improper fraction to a mixed number, divide the numerator by the denominator. The quotient is the whole number part. The remainder is the numerator. And, the denominator stays the same. In this case, $4 \div 3 = 1 \text{ R}1$.

- 1.3** If we wanted to know how high a 5th grade student could jump, how many students would be reasonable to test?
- a. 5 b. 12 c. 30 d. 200

- 1.4** Which data set would be numerical?
- a. favorite color b. hair color c. place of birth d. height of trees

- 1.5** How many people were in the survey shown in this frequency table?

- a. 4
b. 15
c. 27
d. 30

AGE	TALLIES	FREQUENCY
9		2
10		15
11		8
12		2

- 1.6** Use the table from Exercise 1.5. What is the typical age of people shown in the frequency table?
- a. 9 b. 10 c. 11 d. 12

- 1.7** Students were asked what day of the week they were born. Which statement is true?

- a. Fifth grade students are not born on Saturday.
- b. Most fifth grade students are born on Sunday.
- c. There is not enough data to draw a valid conclusion.
- d. Most fifth grade students are born on Tuesday or Wednesday.

DAY	TALLIES	FREQUENCY
Monday		1
Tuesday		3
Wednesday		4
Thursday		2
Friday		4
Saturday		0
Sunday		5

- 1.8** Use the table from Exercise 1.7. How many students were surveyed about the day of the week they were born?

- a. 7 b. 19 c. 20 d. 25

- 1.9** If you were trying to find out how far students could jump and you thought that there would be a wide variety of distances, which of the following would you do? (There may be more than one correct answer.)

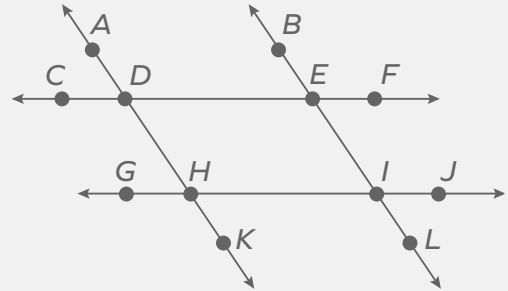
- a. Make the frequency table first.
- b. After the data is collected, arrange it in order.
- c. Make a row for every data value.
- d. Make a frequency table using intervals.

SELF TEST 1: GEOMETRY

Each numbered question = 6 points

Circle each correct letter and answer.

1.01 Which of the following line segments are shown in this diagram? (There may be more than one correct answer.)



- a. \overline{ED}
- b. \overline{EH}
- c. \overline{DH}
- d. \overline{CD}

1.02 Use the diagram from Question 1.01. Which of the following rays are shown? (There may be more than one correct answer.)

- a. \overrightarrow{CG}
- b. \overrightarrow{DH}
- c. \overrightarrow{BF}
- d. \overrightarrow{FE}
- e. \overrightarrow{BL}

1.03 Use the diagram from Question 1.01. Which of the following lines are shown? (There may be more than one correct answer.)

- a. \overleftrightarrow{BE}
- b. \overleftrightarrow{CJ}
- c. \overleftrightarrow{LI}
- d. \overleftrightarrow{FA}
- e. \overleftrightarrow{GJ}

1.04 Use the diagram from Question 1.01. Which lines shown are parallel? (There may be more than one correct answer.)

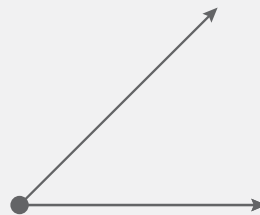
- a. \overleftrightarrow{EI} and \overleftrightarrow{EF}
- b. \overleftrightarrow{HK} and \overleftrightarrow{BE}
- c. \overleftrightarrow{CE} and \overleftrightarrow{HJ}
- d. \overleftrightarrow{AK} and \overleftrightarrow{GI}

1.05 Use the diagram from Question 1.01. Which of the following angles are shown? (There may be more than one correct answer.)

- a. $\angle ADG$
- b. $\angle CEL$
- c. $\angle LIJ$
- d. $\angle BDE$

1.06 What type of angle is shown here?

- a. obtuse
- b. acute
- c. straight
- d. right

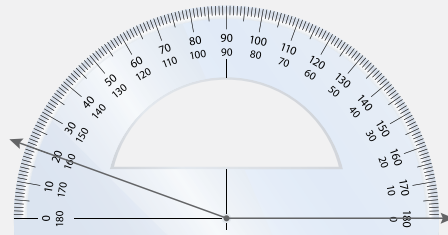


1.07 Estimate the measure of the angle from Question 1.06.

- a. 25°
- b. 45°
- c. 85°
- d. 135°

1.08 What is the measure of angle shown here?

- a. 20°
- b. 60°
- c. 120°
- d. 160°



Madison made the following table to record the height of each person in her family. Use the table to answer Questions 1.09 through 1.13.

NAME	HEIGHT (in feet)
Dad	$6\frac{3}{8}$
Mom	$5\frac{5}{8}$
Madison	$5\frac{1}{6}$
Jade	$4\frac{5}{6}$
Ben	$3\frac{1}{2}$

- 1.09** How much taller is her dad than her mom?
 a. $\frac{3}{4}$ foot b. $1\frac{1}{4}$ feet c. $\frac{1}{4}$ foot d. $1\frac{5}{8}$ feet
- 1.010** If Madison and Jade lay end to end, how far will they reach?
 a. $9\frac{1}{2}$ feet b. 9 feet c. 10 feet d. $10\frac{1}{2}$ feet
- 1.011** Round her mom's height to the nearest half or whole.
 a. 5 feet b. $5\frac{1}{2}$ feet c. 6 feet
- 1.012** Round Jade's height to the nearest half or whole.
 a. 4 feet b. $4\frac{1}{2}$ feet c. 5 feet
- 1.013** About how much taller is her mom than Jade?
 a. 0 feet b. $\frac{1}{2}$ foot c. 1 foot d. $1\frac{1}{2}$ feet

Complete these activities.

- 1.014** Find the difference. Write your answer in simplest form. $\frac{9}{10} - \frac{5}{10}$ _____
- 1.015** Find the sum. Write your answer in simplest form. $\frac{1}{8} + \frac{4}{8}$ _____

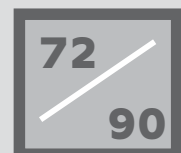


Teacher check:

Score _____

Initials _____

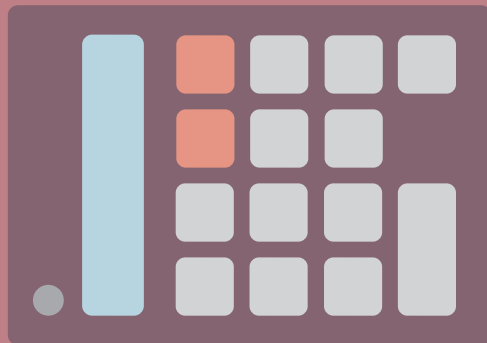
Date _____





MATH

Teacher's Guide



▶ **5th Grade**

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MATH 500

Teacher's Guide

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The following is a guideline to assign letter grades for completed LIFEPACs based on a maximum total score of 100 points.

Example:

LIFEPAC Test	=	60% of the Total Score (or percent grade)
Self Test	=	25% of the Total Score (average percent of self tests)
Reports	=	10% or 10* points per LIFEPAC
Oral Work	=	5% or 5* points per LIFEPAC

*Determined by the teacher's subjective evaluation of the student's daily work.

Example:

LIFEPAC Test Score	=	92%	$92 \times .60 = 55$ points
Self Test Average	=	90%	$90 \times .25 = 23$ points
Reports	=		8 points
Oral Work	=		4 points

TOTAL POINTS = 90 points

Grade Scale based on point system:

100 – 94	=	A
93 – 86	=	B
85 – 77	=	C
76 – 70	=	D
Below 70	=	F

INSTRUCTIONS FOR FIFTH GRADE MATH

The LIFE PAC curriculum from grades two through twelve is structured so that the daily instructional material is written directly into the LIFE PACs. The student is encouraged to read and follow this instructional material in order to develop independent study habits. The teacher should introduce the LIFE PAC to the student, set a required completion schedule, complete teacher checks, be available for questions regarding both content and procedures, administer and grade tests, and develop additional learning activities as desired. Teachers working with several students may schedule their time so that students are assigned to a quiet work activity when it is necessary to spend instructional time with one particular student.

Math is a subject that requires skill mastery. But skill mastery needs to be applied toward

active student involvement. Measurements require measuring cups, rulers, empty containers. Boxes and other similar items help the study of solid shapes. Construction paper, beads, buttons, and beans are readily available and can be used for counting, base ten, fractions, sets, grouping, and sequencing. Students should be presented with problem situations and be given the opportunity to find their solutions.

Any workbook assignment that can be supported by a real-world experience will enhance the student's ability for problem solving. There is an infinite challenge for the teacher to provide a meaningful environment for the study of math. It is a subject that requires constant assessment of student progress. Do not leave the study of math in the classroom.

ANSWER KEYS

SECTION 1

- 1.1** a. 2
b. 4
c. 6
d. 3
e. 1
f. 5

1.2 b

1.3 d

1.4 c

1.5 a

1.6 b

1.7 d

1.8 Answers will vary. Students should write a number that has a 7 in the thousands place. One example is 87,000.

1.9 a

1.10 d

1.11 c

1.12 b

1.13 eight million, four hundred nine thousand, one hundred twenty

Students should use commas correctly and not use the word *and*.

1.14 a

1.15 c

1.16 d

1.17 d

1.18 a. 2
b. 1

1.19 a

1.20 a

1.21 b

1.22 b

1.23 c

1.24 a

1.25 d

1.26 c

1.27 b

Earth is 149,598,262 kilometers from the Sun, and Venus is 108,209,475 kilometers from the Sun. So, Earth is farther from the Sun than Venus.

1.28 4,506 4,522 4,690 4,692
1.29 945,230 1,249,000 1,853,100 50,489,200

- 1.30** a. 2
b. 1
c. 4
d. 3

- 1.31** a. 4
b. 2
c. 3
d. 5
e. 1

1.32 true

1.33 d

1.34 a

1.35 b

1.36 d

1.37 d

1.38 c

1.39 a

1.40 c

1.41 b

1.42 a

1.43 d

1.44 b

1.45 a

1.46 a

1.47 b

1.48 c

1.49 greater, larger, larger in value, etc.

1.50 c

1.51 c

1.52 0.004 0.04 0.044 0.404

1.53 5.07 5.2 6.035 6.305

1.54 10.08 10.175 10.5 10.54

1.55 b

1.56 c

1.57 a

1.58 a

1.59 b

1.60 b

1.61 a

1.62 d

1.63 0.45 0.7 0.963

1.64 2.008 2.08 2.8

1.65 5.899 15.2 50.76 150.0

1.66 9.15 9.3 9.376 9.51

SELF TEST 1

1.01 false

Whole numbers do not use the word *and*.

1.02 true

1.03 ten thousands

1.04 c

1.05 d

1.06 a

1.07 b

1.08 a

1.09 b

1.010 b

1.011 c

1.012 232,407 232,411 235,116 235,305

1.013 5.0 5.008 5.15

1.014 9

1.015 3

SECTION 2

2.1 rounding

2.2 c

The digit to the right of the hundreds place (7) is greater than 5, so round 5 up to 6.

2.3 b

The digit to the right of the millions place (9) is greater than 5, so round 8 up to 9.

2.4 a

7 is in the hundreds place. The digit to the right of the hundreds place (0) is less than 5, so keep 7 the same.

2.5 d

0 is in the tens place. The digit to the right of the tens place (3) is less than 5, so keep 0 the same.

2.6 c

9 is in the thousands place. The digit to the right of the thousands place is greater than 5, so round 9 up to 10.

2.7 b

The digit to the right of the tenths place (7) is greater than 5, so round 3 up to 4.

2.8 d

The digit to the right of the hundredths place (2) is less than 5, so keep 9 the same.

2.9 b

8 is in the ones place. The digit to the right of the ones place (5) is 5 so round 8 up to 9.

2.10 b

9 is in the tenths place. The digit to the right of the tenths place (7) is greater than 5, so round 9 up to 10.

SELF TEST 2

2.01 false

The largest place value they have in common is the ones place.

2.02 true

2.03 b

2.04 b

The digit to the right of the hundreds place (2) is less than 5, so keep 9 the same. The digits to the right of the hundreds place become zeros.

2.05 a

1 is in the thousands place. The digit to the right of the thousands place (7) is greater than 5, so round 1 up to 2. The digits to the right of the thousands place become zeros.

2.06 b

4 is in the ones place. The digit to the right of the ones place (2) is less than 5, so keep 4 the same. The digits to the right of the ones place become zeros.

2.07 c

The digit to the right of the hundreds place (6) is greater than 5, so round 9 up to 10. The 4 becomes 5 and the 9 becomes a zero. The digits to the right of the hundredths place become zeros.

2.08 b

$$5 + 9 = 14$$

2.09 b

$$9,000 - 4,000 = 5,000$$

2.010 a

$$130 + 60 = 190$$

2.011 c

$$\$5 - \$2 = \$3$$

2.012 c

2.013 76

$$49 + 20 = 69$$

$$69 + 7 = 76$$

2.014 275

$$40 + 15 = 55$$

$$220 + 55 = 275$$

2.015 273

$$578 - 300 = 278$$

$$278 - 5 = 273$$

ALTERNATE LIFE PAC TEST

1. false

4 is in the thousandths place.

2. true

$$700 - 600 = 100$$

3. 67,500 612,009 612,052 614,100

4. d

5. a

6. a

7. c

$$\begin{array}{r}
 ^7 ^{10} \\
 138.\cancel{0}\cancel{0} \\
 - 138.05 \\
 \hline
 0.75
 \end{array}$$

8. b

9. d

10. a

11. d

The 2 is in the thousands place. The digit to the right of it (4) is less than 5, so keep 2 the same.

12. c

13. a

$$\begin{array}{r}
 ^2 ^2 \\
 \$1.45 \\
 \$0.89 \\
 + \$0.79 \\
 \hline
 \$3.13
 \end{array}$$

14. b

$$158 + 6 = 164$$

15. b

$$\begin{array}{r}
 ^6 ^{14} ^2 ^{10} \\
 \cancel{67,430} \\
 - 35,614 \\
 \hline
 31,816
 \end{array}$$

16. a

$$\begin{array}{r}
 ^1 ^1 \\
 35,614 \\
 + 67,430 \\
 \hline
 103,044
 \end{array}$$

17. 15.7

The 6 is in the tenths place. The digit to the right of it (8) is greater than 5, so round 6 up to 7.

18. 14.92

$$\begin{array}{r}
 6.50 \\
 + 8.42 \\
 \hline
 14.92
 \end{array}$$

19. 4.55

$$\begin{array}{r}
 ^9 \\
 ^7 ^1 ^{10} \\
 \cancel{8.00} \\
 - 3.45 \\
 \hline
 4.55
 \end{array}$$

20. 80

$$20 + 60 = 80$$

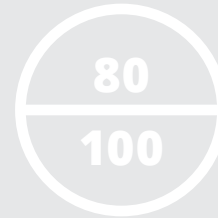
MATH 501

ALTERNATE LIFEPAC TEST

NAME _____

DATE _____

SCORE _____



Each numbered question = 5 points.

Answer *true* or *false*.

- _____ In the number 6.814, 4 is in the hundredths place.
- _____ Using rounding, a good estimate for $712 - 589$ is 100.

Place these numbers in order from smallest to largest.

3. 612,052 614,100 612,009 67,500

Circle the correct letter and answer.

- In the number 82,129,000,000, the digit 1 is in the _____ place.
 a. billions b. ten billions c. millions d. hundred millions
- Compare using $<$, $>$, or $=$. 915,000,000 _____ 2,140,000,000
 a. $<$ b. $>$ c. $=$
- Bennett is 138.8 centimeters tall, Garrett is 138.45 centimeters tall, and Kayla is 138.05 centimeters tall. Who is the tallest?
 a. Bennett b. Garrett c. Kayla
- Bennett is 138.8 centimeters tall, Garrett is 138.45 centimeters tall, and Kayla is 138.05 centimeters tall. What is the difference in height between Bennett and Kayla?
 a. 0.3 centimeters b. 0.03 centimeters c. 0.75 centimeters d. 0.4 centimeters
- Which whole number property is demonstrated here? $23 + 2 = 2 + 23$
 a. Associative Property of Addition
 b. Commutative Property of Addition
 c. Identity Property of Addition

9. In word form, 4.02 is _____ .
- a. four and two tenths
b. four hundred two
c. four two tenths
d. four and two hundredths
10. What is 8,205,000 in expanded form?
- a. 8,000,000 + 200,000 + 5,000
b. 8,000,000 + 200,000 + 50,000
c. 8,000 + 200 + 5
d. 8,000,000 + 20,000 + 5,000
11. Round 452,489 to the nearest thousand.
- a. 453,000 b. 450,000 c. 500,000 d. 452,000
12. Martin is at a basketball game. The concession stand menu is shown here. Put the menu items in order from least expensive to most expensive.
- a. candy, soda, nachos, pizza
b. soda, candy, pizza, nachos
c. soda, candy, nachos, pizza
d. candy, soda, pizza, nachos
- | ITEM | COST |
|--------|--------|
| Pizza | \$1.45 |
| Candy | \$0.89 |
| Nachos | \$1.25 |
| Soda | \$0.79 |
13. Refer to the menu from Question 12. How much will it cost to buy pizza, candy, and soda?
- a. \$3.13 b. \$2.93 c. \$3.59 d. \$3.49
14. To find the sum of 58 and 106 in her head, Janie followed these steps:
She added 58 to 100 and got 158. She then added 158 to 6 and got 162.
Which statement is true?
- a. Janie's answer is wrong. She should have added 60 to 158.
b. Janie's answer is wrong. She added 158 to 6 incorrectly.
c. Janie's answer is wrong. She added 58 to 100 incorrectly.
d. Janie's answer is right.
15. Marcus and Ryan are at an arcade. Marcus scored 35,614 points on a video game. Ryan scored 67,430 points on the same game. How many more points did Ryan score than Marcus?
- a. 32,224 b. 31,816 c. 31,824 d. 32,816
16. Marcus and Ryan are at an arcade. Marcus scored 35,614 points on a video game. Ryan scored 67,430 points on the same game. What was their combined score?
- a. 103,044 points b. 102,044 points c. 92,144 points d. 93,144 points

Write the correct answer on the line.

17. Round 15.682 to the nearest tenth. _____
18. Add. $6.5 + 8.42$ _____
19. Subtract. $8 - 3.45$ _____
20. Round each number to the nearest ten to estimate. $22.6 + 63.1$ _____