Name _____   Date_____

Division of Integers

1. Mrs. McIntire, a seventh grade math teacher, is grading papers. Three students gave the following responses to the same math problem:

Student one: $\dfrac{1}{-2}$

Student two: $-\left(\dfrac{1}{2}\right)$

Student three: $-\dfrac{1}{2}$

On Mrs. McIntire's answer key for the assignment, the correct answer is -0.5. Which student answer(s) is (are) correct? Explain.

2. Complete the table below. Provide an answer for each integer division problem and write a related equation using integer multiplication.

Integer Division Problem	Related Equation Using Integer Multiplication
$-36 \div (-9) =$ _____	
$24 \div (-8) =$ _____	
$-50 \div 10 =$ _____	
$42 \div 6 =$ _____	

1. Find the missing values in each column.

Column A	Column B	Column C	Column D
$48 \div 4 =$	$24 \div 4 =$	$63 \div 7 =$	$21 \div 7 =$
$-48 \div (-4) =$	$-24 \div (-4) =$	$-63 \div (-7) =$	$-21 \div (-7) =$
$-48 \div 4 =$	$-24 \div 4 =$	$-63 \div 7 =$	$-21 \div 7 =$
$48 \div (-4) =$	$24 \div (-4) =$	$63 \div (-7) =$	$21 \div (-7) =$

2. Describe the pattern you see in each column's answers in Problem 1, relating it to the problems' divisors and dividends. Why is this so?

3. Describe the pattern you see between the answers for Columns A and B in Problem 1(e.g., compare the first answer in Column A to the first answer in Column B; compare the second answer in Column A to the second answer in Column B). Why is this so?

4. Describe the pattern you see between the answers for Columns C and D in Problem 1. Why is this so?

1. Mrs. McIntire, a seventh grade math teacher, is grading papers. Three students gave the following responses to the same math problem:

    Student one: $\dfrac{1}{-2}$

    Student two: $-\left(\dfrac{1}{2}\right)$

    Student three: $-\dfrac{1}{2}$

    On Mrs. McIntire's answer key for the assignment, the correct answer is -0.5. Which student answer(s) is (are) correct? Explain.

    All student answers are correct, since they are all equivalent to -0.5.

    For student one: $\dfrac{1}{-2}$ means 1 divided by -2. When dividing a positive 1 by a negative 2, the answer will be negative five-tenths or -0.5.

    For student two: $-\left(\dfrac{1}{2}\right)$ means the opposite of $\dfrac{1}{2}$. One-half is equivalent to five-tenths, and the opposite is negative five-tenths or -0.5.

    For student three: $-\dfrac{1}{2}$ means -1 divided by 2. When dividing a negative 1 by a positive 2, the answer will be negative five-tenths or -0.5.

2. Complete the table below. Provide an answer for each integer division problem and write a related equation using integer multiplication.

Integer Division Problem	Related Equation Using Integer Multiplication
$-36 \div (-9) = $ ___4___	$-9 \times 4 = -36$ *or* $4 \times (-9) = -36$
$24 \div (-8) = $ ___-3___	$-8 \times (-3) = 24$ *or* $-3 \times (-8) = 24$
$-50 \div 10 = $ ___-5___	$-5 \times 10 = -50$ *or* $10 \times (-5) = -50$
$42 \div 6 = $ ___7___	$6 \times 7 = 42$ *or* $7 \times 6 = 42$

1. Find the missing values in each column.

Column A	Column B	Column C	Column D
$48 \div 4 = 12$	$24 \div 4 = 6$	$63 \div 7 = 9$	$21 \div 7 = 3$
$-48 \div (-4) = 12$	$-24 \div (-4) = 6$	$-63 \div (-7) = 9$	$-21 \div (-7) = 3$
$-48 \div 4 = -12$	$-24 \div 4 = -6$	$-63 \div 7 = -9$	$-21 \div 7 = -3$
$48 \div (-4) = -12$	$24 \div (-4) = -6$	$63 \div (-7) = -9$	$21 \div (-7) = -3$

2. Describe the pattern you see in each column's answers in Problem 1, relating it to the problems' divisors and dividends. Why is this so?

The pattern in the columns' answers is the same two positive values followed by the same two negative values. This is so for the first two problems because the divisor and the dividend have the same signs and absolute values, which yields a positive quotient. This is so for the second two problems because the divisor and dividend have different signs but the same absolute values, which yields a negative quotient.

3. Describe the pattern you see between the answers for Columns A and B in Problem 1 (e.g., compare the first answer in Column A to the first answer in Column B; compare the second answer in Column A to the second answer in Column B). Why is this so?

The answers in Column B are each one-half of the corresponding answers in Column A. That is because the dividend of 48 in Column A is divided by 4, and the dividend of 24 in Column B is divided by 4 (and so on with the same order and same absolute values but different signs). Since 24 is half of 48, the quotient (answer) in Column B will be one-half of the quotient in Column A.

4. Describe the pattern you see between the answers for Columns C and D in Problem 1. Why is this so?

The answers in Column D are each one-third of the corresponding answers in Column C. That is because the dividend of 63 in Column C is divided by 7, and the dividend of 21 in Column D is divided by 7 (and so on with the same order and same absolute values but different signs). Since 21 is one-third of 63, the quotient (answer) in Column D will be one-third of the quotient in Column C.