Algebra 1 Unit 1 worksheet: Identity and inverse elements

Name _____ Date _____ Period _____

1. The reciprocal of a number is $-\frac{4}{3}$.

(a) What is the number?

(b) What is the additive inverse of the number?

(c) Find the sum of the number and its reciprocal.

2. Jack finds the reciprocal of $4\frac{5}{8}$ by turning only the fraction part over, and gets $4+\frac{8}{5}$.

(a) Multiply $4\frac{5}{8}$ by $4+\frac{8}{5}$ to test the claim.

(b) Find the correct reciprocal of $4\frac{5}{8}$.

3. (a) Owen says the additive inverse of $x-7$ is $x+7$. Add the two expressions to test his claim, then give the correct additive inverse.

(b) Find the additive inverse of $-4y+9$, and check by adding.

(c) Find the multiplicative inverse of $\frac{5}{w}$, and say which value of w is not allowed.

(d) Find the multiplicative inverse of $3m$, and say which value of m is not allowed.

4. (a) Rewrite $-\frac{5}{8}\div\frac{2}{5}\div(-5)$, worked from left to right, as one product of three numbers, then evaluate it.

(b) Evaluate $-\frac{5}{8}\div\left(\frac{2}{5}\div(-5)\right)$. Is it the same number as in part (a)?

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5. (a) Solve $-\frac{4}{3}(x-7)=20$, naming the inverse you use at each step.

(b) In $\frac{2}{3}x+4=10$ the opposite of 4 is used before the reciprocal of $\frac{2}{3}$. Explain why the order is the other way round in part (a).

6. Decide whether each statement is true for every real number a it mentions. If it is not, give a value of a that makes it fail.

(a) $0 \div a = 0$

(b) $a \div a = 1$

(c) $-(-a) = a$

(d) $1 \div a = a$

(e) $-a$ is a negative number.

(f) $\dfrac{1}{1/a} = a$ for every $a \neq 0$

7. Explain why $(-1)\cdot a = -a$ for every real number a. Start from $a + (-1)\cdot a$ and give the property behind each step. You may use the fact, proved in the lesson, that $0 \cdot b = 0$ for every b.

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