

Trimester 2 Review Sheet

Operations with Rational Numbers

Adding Rational Numbers

Rules for Adding Fractions

1. Find a common denominator. The least common denominator (LCD) is best, but not necessary.
2. Add the numerators. Keep the denominator the same.
3. Simplify, if necessary. Rename, if necessary.

Rules for Adding Decimals

1. Line up the decimals.
2. Add like we do with whole numbers. The decimal drops straight down.

Rules for Adding Integers

- positive + positive = positive
 - negative + negative = negative
 - positive + negative = ?
 - negative + positive = ?
- Add the absolute values of the two numbers.
- Subtract the absolute values of the two numbers. Take the sign of the larger number.

Subtracting Rational Numbers

Rules for Subtracting Fractions

1. Find a common denominator. The least common denominator (LCD) is best, but not necessary.
2. Subtract the numerators. If we have mixed numbers, we may have to borrow. Keep the denominator the same.
3. Simplify, if necessary. Rename, if necessary.

Rules for Subtracting Decimals

1. Line up the decimals.
2. Subtract like we do with whole numbers. The decimal drops straight down.

Rules for Subtracting Integers

1. Change minus sign to add the opposite (- to +).
2. Follow the rules for adding integers.

Examples:

1. $(-11.4) + (7.95) = \boxed{-3.45}$

$$\begin{array}{r} 0'03' \\ 11.40 \\ - 7.95 \\ \hline 3.45 \end{array}$$

2. $\frac{8}{9} + (-1\frac{2}{3}) = \boxed{-\frac{7}{9}}$

$$\begin{array}{l} \frac{2 \times 3}{3 \times 3} = \frac{6}{9} = \frac{15}{9} \\ - \frac{8}{9} = - \frac{8}{9} = - \frac{8}{9} \\ \hline \frac{7}{9} \end{array}$$

3. $-17.2 \ominus 3.87 =$
 $-17.2 \oplus -3.87 = \boxed{-21.07}$

$$\begin{array}{r} 17.20 \\ + 3.87 \\ \hline 21.07 \end{array}$$

4. $-2\frac{3}{5} \ominus \frac{1}{3} =$
 $-2\frac{3}{5} \oplus -\frac{1}{3} = \boxed{-2\frac{14}{15}}$

$$\begin{array}{l} 2\frac{3 \times 3}{5 \times 3} = 2\frac{9}{15} \\ + \frac{1 \times 5}{3 \times 5} = +\frac{5}{15} \\ \hline 2\frac{14}{15} \end{array}$$

Multiplying Rational Numbers

Rules for Multiplying Fractions

1. Change mixed numbers and whole numbers to improper fractions.
2. Multiply the numerators. Multiply the denominators. Cross cancel, if possible.
3. Simplify, if necessary. Rename, if necessary.

Rules for Multiplying Decimals

1. Multiply as if there are no decimals (like we are multiplying two whole numbers).
2. Count the number of total decimal places in the factors. This sum is the number of decimal places in our product (the answer to a multiplication problem).

Rules for Multiplying Integers

- positive \times positive = positive
- negative \times negative = positive
- positive \times negative = negative
- negative \times positive = negative

Dividing Rational Numbers

Rules for Dividing Fractions

1. Change mixed numbers and whole numbers to improper fractions.
2. Keep the first fraction the same. Change the division sign (\div) to a multiplication sign (\times). Find the reciprocal of the second fraction (flip the fraction).
3. Multiply the numerators. Multiply the denominators. Cross cancel, if possible.
4. Simplify, if necessary. Rename, if necessary.

Rules for Dividing Decimals

1. Move the decimal in the divisor (the one doing the dividing; the one outside the "house") as many places to the right as necessary to make a whole number. Move the decimal in the dividend (the one being divided; the one inside the "house") the same number of places to the right.
2. Divide like we do with whole numbers. The decimal goes straight up.

Rules for Dividing Integers

- positive \div positive = positive
- negative \div negative = positive
- positive \div negative = negative
- negative \div positive = negative

Examples:

1. $15.2 \times (-0.18) = \boxed{-2.736}$

$$\begin{array}{r} 4' \\ 15.2 \leftarrow -1 \\ \times 0.18 \leftarrow +2 \\ \hline 1216 \\ +1520 \\ \hline 2736 \quad \bar{3} \end{array}$$

2. $-\frac{3}{7} \times (-2\frac{4}{5}) = \boxed{1\frac{1}{5}}$

$$-\frac{3}{7} \times (-\frac{14^2}{5}) = \frac{6}{5} = 1\frac{1}{5}$$

3. $-5 \div (-1\frac{2}{3}) = \boxed{3}$

$$-\frac{5}{1} \div (-\frac{5}{3}) =$$

$$-\frac{1}{1} \times (-\frac{3}{1}) = \frac{3}{1} = 3$$

4. $-101.088 \div 7.02 = \boxed{-14.4}$

$$\begin{array}{r} 14.4 \\ 7.02 \overline{) 101.088} \\ \underline{702} \\ 3088 \\ \underline{2808} \\ 2808 \\ \underline{-2808} \\ \hline \hline \end{array}$$