

Name: \_\_\_\_\_

### Math 221: Final Worksheet 3

Instructions: Complete this as review for the Test 3 material. It is not a standalone review, so be sure to also review old tests, quizzes, homework, etc, as well as the final theory review sheet.

1. Represent the following operations using the chip/charged field model and the number line model.

(a)  $3 + ^{-}4 = ^{-}1$

(b)  $2 - 3 = ^{-}1$

(c)  $3 \times ^{-}2 = ^{-}6$

2. Fill in the blank with  $<$ ,  $>$ , or  $=$ . Explain your answers.

(a)  $\frac{11}{30}$  —  $\frac{9}{25}$

(b)  $\frac{5}{15}$  —  $\frac{4}{10}$

(c)  $0.\overline{323}$  —  $0.\overline{32}$

3. Draw a figure to represent the following problems.

(a)  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

(b)  $\frac{3}{6} - \frac{2}{6} = \frac{1}{6}$

(c)  $\frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$

4. Use the specified method (standard algorithm for d-f) to perform the following operations. Write your answers in simplest form and in the same form as the numbers in the problem.

(a)  $\frac{11}{30} + \frac{29}{45}$  (*Least Common Denominator*)

(b)  $3\frac{1}{4} - 1\frac{5}{12}$  (*No Improper Fraction Conversions*)

(c)  $\frac{42}{33} \times \frac{110}{175}$  (*Simplify First*)

(d)  $\frac{13}{15} \div \frac{3}{5}$  (Missing Factor Definition or Carefully Explained Reciprocal)

(e)  $10.27 - 5.689$  (Standard Algorithm)

(f)  $6.28 \times 0.53$  (Standard Algorithm)

(g)  $1.742 \div 0.13$  (Standard Algorithm)

5. Explain why  $1.450 = 1.45$  using the definition of a decimal.
6. Convert the following fractions to decimals. Check first if it is possible to write the fraction as a terminating decimal, and if so, do so by getting a power of 10 in the denominator, **NOT** long division.
- (a)  $\frac{9}{48}$
- (b)  $\frac{14}{42}$
7. For decimal 13.079, (a) write it in expanded form, (b) write it as a whole number plus a single fraction over a common denominator, (c) write in words how to read this decimal, and (d) identify the digit in the units and thousandths places.

8. Convert the following decimals to simplified fractions.

(a) 0.74

(b)  $0.1\bar{3}$

9. Prove the following theorem: If  $\frac{a}{b}$  and  $\frac{c}{d}$  are any two rational numbers, then  $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$ .

10. Kevin is learning to add fractions using the rule above. He claims that there is no reason to learn how to find the least common denominator because he can always just simplify the fraction after doing this cross multiplication rule. How would you help him find value in the least common denominator?