

Review for Exam III

Your third exam will be similar to exams I and II. The exam will have 10 problems worth 10 points each. Here is a list of topics:

- From 3.1: Be able to look at a list of symbols and translate numbers from other systems to our system we use today.
- From 5.1-5.3: Know how to use the various models of integers to solve arithmetic problems.
- From 6.1: Know the basic models for fractions.
- From 6.2: Know the models for fraction addition and subtraction.
- From 6.3: Know how to multiply and divide fractions. Also, know why the proof of multiplying by the reciprocal works when dividing fractions.

Example Problems:

1. Draw the colored counters diagram which illustrates the following problems.
 - (a) $(-4) + 6$
 - (b) $5 - (-3)$
 - (c) $(-5) - (-3)$
2. Carefully illustrate the following computations in the number line model.
 - (a) $3 + 4$
 - (b) $-4 + 5$
 - (c) $-3 - 4$
 - (d) $2 - (-3)$
 - (e) $-1 - (-3)$
3. Carefully describe the mailtime stories which model the following arithmetic problems.
 - (a) $41 + (-7)$
 - (b) $41 - 7$
 - (c) $20 - (-15)$
 - (d) $-20 - 15$
4. Carefully describe the mailtime stories which model the following arithmetic problems. A one sentence story per problem is sufficient.
 - (a) $2 \cdot (-4) + 3 \cdot 7$

(b) $3 \cdot (-5) - 3 \cdot 8$

(c) $4 \cdot 5 - 7 \cdot (-21)$

5. Compute the following:

(a) $5 +_{12} 9$

(b) $7 -_{12} 9$

(c) $8 \times_{12} 5$

(d) $5 \div_{12} 7$

6. In arithmetic with integers the following property is true: if $a \times b = 0$, at least one of a and b is zero. Is this true in 12 hour clock arithmetic? If it is, explain. If it is not true provide a counterexample.

7. Use the multiplication table on page 331 to compute the following. If an answer does not exist, explain why.

(a) $10 \div_{12} 7$

(b) $10 \div_{12} 2$

(c) $10 \div_{12} 2$

8. For each of the following pairs of fractions, use the test we described in class to determine which of the fractions is the smaller. Show your work!

(a) $\frac{5}{16}, \frac{11}{32}$

(b) $\frac{7}{8}, \frac{7}{9}$

(c) $\frac{10}{11}, \frac{11}{13}$.

9. Show that $\frac{a}{b} < \frac{c}{d}$ when $ad < bc$.

10. Represent the fractions $3/4$ and $5/8$ in the colored regions, sets, fraction strips, and number line models.

11. Illustrate the following computations in the colored regions, fractions strips, and number lines models:

(a) $\frac{3}{2} + \frac{3}{4}$

(b) $3\frac{3}{5} - 2$

12. Convert $\frac{10}{3}$ to a mixed number and $3\frac{2}{3}$ to an improper fraction. Show all your work and then illustrate your work with one of the models from class.

13. Perform the following fraction computations. Show your work as if you were presenting the problem to a 4th grade classroom. That is, explain each step and use models if appropriate.

(a) $\frac{2}{3} + \frac{1}{2}$

- (b) $\frac{5}{6} - \frac{3}{4}$
- (c) Convert $2\frac{3}{5}$ to an improper fraction.
- (d) Convert $\frac{17}{3}$ to a mixed number.
14. Write 5,232 in expanded notation.
15. Use a number line diagram to show that if a, b, n are integers and $a < b$ then $a + n < b + n$ and $-b < -a$.
16. State the Cross Product Property of Equivalent Fractions.
17. Write $\frac{396}{432}$ in simplest form, and explain how you know when you are done.
18. Explain in 2 sentences how to get equivalent fractions with a common denominator for $\frac{2}{3}$ and $\frac{5}{9}$.
19. Use the rectangular area model to compute $\frac{3}{5} \times \frac{6}{5}$.
20. A bag contains 14 balls. Some are red and some are yellow. $\frac{3}{7}$ of the balls are yellow. How many of the balls are red?
21. Know homework problem 6.3 number 10.
22. Know example 6.12 on page 381.

Study Tips

1. Begin studying today!
2. Glance through the book/notes and identify any topics that you do not know/understand. Read more about these, and ask me questions.
3. Do the entire review sheet.
4. Do the practice exam.
5. Look over the homework. (All solutions are on the webpage.)
6. Get together with other people and discuss the concepts.
7. Get a good night's sleep the night before and relax the morning of the exam.

Good Luck!