

Practice Exam 2, Math 266
Spring 2002

The actual exam will consist of 15 problems, each worth 2 points, of the type given on the homework and on the list below. Every answer should show work or otherwise explain how the problem was done.

1. What is the definition of a prime number?
2. Find the prime factorization of 900.
3. Is 756 divisible by 2? By 3? By 4? By 6? By 9? By 10?
4. Is 210_5 divisible by 2? Is 32012_5 divisible by 4?
5. Explain why there are an infinite number of primes.
6. How does the Fundamental Theorem of Arithmetic tell you, without doing any more work, that 7 does not divide the number whose prime factorization is $3 \cdot 5 \cdot 5 \cdot 11 \cdot 13$?
7. Find the greatest common divisor of two numbers. Know how to do this either with Euclid's Algorithm or by using the prime factorization of each number. Be able to explain why these methods work.
8. Use the Simplified Method or Prime Factorization to find the least common multiple of several numbers. Be able to explain why these methods work.
9. If you begin an exercise workout on Saturday and you continue doing it every five days, how many days before you do the exercise on a Saturday again?
10. Your friend begins the same work out on Saturday with you, but she plans to repeat it every four days. How many days before you both workout together on a Saturday again?
11. What is the definition of rational number?
12. Describe in words the point on the number line represented by the fraction $\frac{5}{7}$? By the mixed fraction $3\frac{2}{5}$.
13. Express $\frac{13}{5}$ as a mixed fraction and explain why this mixed fraction has the same value as $\frac{13}{5}$.

14. Explain why $\frac{3}{5}$ and $\frac{6}{10}$ have the same value. As part of your explanation draw appropriate intervals on the number line.
15. Explain why $\frac{12}{32}$ and $\frac{15}{40}$ have the same value. In this explanation you may use Theorem 26 which states: *If n is a natural number, then the fractions $\frac{p}{q}$ and $\frac{p \cdot n}{q \cdot n}$ have the same value.*
16. Which is larger, $\frac{14}{26}$ or $\frac{30}{57}$? Show enough work to indicate your method for answering this question.
17. For rational numbers x and y , define $x + y$.
18. Using the definition of addition of rational numbers, explain what the value of $x + y$ is, if x is represented by the fraction $\frac{4}{7}$ and y is represented by the fraction $\frac{2}{3}$.
19. Write the order and grouping you would use to calculate in your head the sum $3\frac{4}{11} + 5\frac{4}{7} + 8\frac{7}{11}$. Cite properties which justify these procedures.
20. For rational numbers x and y with $y \leq x$, define the difference $x - y$.
21. Using the definition of subtraction of rational numbers, explain what the value of $x - y$ is, if x is represented by the fraction $\frac{3}{4}$ and y is represented by $\frac{1}{3}$.
22. Compute $5\frac{4}{9} + 2\frac{1}{3} - 3\frac{1}{9}$ and explain your method.