Simplify all answers and show your work!

1. Fill in the blank: \( \frac{3}{8} = \frac{\boxed{56}}{\boxed{56}} \)

2. What is a common denominator for \( \frac{12}{8} - \frac{5}{12} \)? \( \boxed{24} \)

3. In order to add or subtract fractions/mixed numbers, they must have a common \( \boxed{\text{common denominator}} \).

4. How many factors does a prime number have? \( \boxed{2} \)

5. Is the number “1” considered prime, composite, neither, or both? \( \boxed{neither} \)

6. Add: \( \frac{5}{4} + 1\frac{3}{8} \)

7. Add: \( \frac{4}{3} + 2\frac{5}{6} \)

8. Add: \( \frac{7}{16} + \frac{5}{8} \)

9. Subtract: \( 8\frac{5}{6} - 4\frac{7}{18} \)

10. Subtract: \( 11\frac{4}{9} - 7\frac{7}{12} \)

11. Subtract: \( 22 - 15\frac{5}{8} \)

12. Subtract: \( \frac{11}{14} - \frac{8}{21} \)

13. Add: \( \frac{25}{36} + \frac{5}{36} \)

14. Subtract: \( \frac{11}{16} - \frac{9}{16} \)

15. Multiply: \( \frac{12}{35} \cdot \frac{10}{18} \)

16. Solve for \( x \). \( \frac{3}{10} = \frac{x}{60} \)

17. Solve for \( x \). \( \frac{6}{9} = \frac{20}{x} \)
Write the following ratios or rates in lowest terms:

18. $30$ to $45$  
19. $250$ miles on $9$ gallons  
20. $36$ minutes to $12$ minutes

21. Simplify: \( \frac{3}{5} + \frac{14}{15} - \frac{7}{10} \)  
22. Write in lowest terms: \( \frac{36}{45} \)  
23. Find the prime factorization of $72$.

24. Determine if the following fractions are equivalent. Justify your answer. \( \frac{21}{24} = \frac{35}{40} \)

25. Find all factors of $42$.

26. What is the least common multiple of $20$, $24$, and $30$? (In other words, if you had a problem like \( \frac{1}{20} + \frac{1}{24} + \frac{1}{30} \), what would be the least common denominator?)

27. In a class of $24$ people, $18$ people are wearing trousers.
   a) How many people are not wearing trousers?  
   b) What fraction of the class is wearing trousers?  
   c) What fraction of the class is not wearing trousers?

28. Sarah can drive $75$ miles in $2$ hours on the highway. At this rate, how many miles can she drive in $6$ hours?  
29. A recipe that serves $4$ people uses $6$ cups of sugar. How many cups of sugar are needed for the same recipe prepared for $24$ people?