

## Prime Factorization, GCF, and LCM

1. List all prime numbers less than 100, from small to large.
  2. Express 3,810 as a product of its prime factors using index notation. What is the largest prime number that is a factor of 3,810?
  3. Find the prime factorization of the following:  
(a) 60            (b) 150            (c) 252            (d) 396
  4. Write down the smallest 3-digit number which is divisible by 7 and 9.
  5. Find the GCF of following sets:  
(a) 96, 142, 136, 344            (b)  $21x^2y$ ,  $9xyz$
  6. The GCF of two numbers is 9. If the sum of the two numbers is 72, find the numbers. (Find all the possible pairs of numbers.)
  7. Find the LCM of each pair of numbers:  
(a) 126, 195                            (b) 16, 36, 40, 15
  8. The GCF of two numbers is 1, and the LCM of these two numbers is 221. What are the numbers?
  9. Find the smallest number which when divided by 20, or 28, or 52 leaves a remainder of 9.
  10. The product of all prime numbers between 1 and 50 is divided by 4, what is the remainder?
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## Fractions and Decimals

1. Simplify the following fractions.

(a)  $\frac{182}{48}$                       (b)  $\frac{15ac}{35ab}$

2. Which comparison is true?

(A)  $\frac{1}{4} < \frac{2}{10}$       (B)  $\frac{2}{3} < \frac{1}{2}$       (C)  $\frac{1}{5} < \frac{2}{4}$       (D)  $\frac{1}{3} < \frac{2}{7}$

3. John added and multiplied the fractions as the following:

(a)  $6\frac{1}{3} + 7\frac{1}{4} = 6 + \frac{1}{3} + 7 + \frac{1}{4} = 13 + \frac{4}{12} + \frac{3}{12} = 13 + \frac{7}{12} = 13\frac{7}{12}$

(b)  $6\frac{1}{3} \times 7\frac{1}{4} = 6 \times 7 \times \frac{1}{3} \times \frac{1}{4} = 42\frac{1}{12}$

Check John's answers are correct or not. What are the correct answers?

4. Evaluate and simplify:

(a)  $\frac{1}{6} \div \frac{3}{4} \div \left(\frac{3}{8} \div \frac{1}{4}\right)$       (b)  $\frac{21+3^2}{18 \div 5}$       (c)  $\frac{4 \times 8 - 24 \div 6}{30 + 4 \times 3} - 2 \div 6$

5. Simplify the complex fractions:

(a)  $\frac{\frac{1}{2} + \frac{1}{3}}{\frac{1}{2} - \frac{1}{3}}$                       (b)  $\frac{4\frac{1}{2} - \frac{2}{3}}{\frac{8}{13} \times 4\frac{1}{3}}$

6. Evaluate and solve the following:

(a)  $2.5^2 - 2.3 \times 0.6$

(b) Find the number which when divided by 0.003 gives an exact answer of 1.5.

7. Convert the recurring decimals to fractions:

(a)  $0.\overline{18}$       (b)  $2.\overline{7}$       (c)  $0.1\overline{96}$       (d)  $0.0\overline{15}$

8. Express the product  $\frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} \times \frac{7}{8} \times \frac{8}{9} \times \frac{9}{10} \times \frac{10}{11} \times \frac{11}{12}$  in simplest form.

9. Express as a single fraction:  $\frac{7}{19} \times \frac{13}{44} + \frac{7}{19} \times \frac{19}{44} + \frac{7}{19} \times \frac{23}{44} + \frac{7}{19} \times \frac{27}{44} + \frac{7}{19} \times \frac{3}{22}$ .

10. Find two positive integers whose reciprocals sum to:

(a)  $\frac{1}{2}$       (b)  $\frac{1}{3}$       (c)  $\frac{1}{4}$       (d)  $\frac{1}{5}$       (e)  $\frac{1}{6}$       (f)  $\frac{1}{7}$

## Real Numbers

1. Calculate:  $2016 \times 2017 - 2015 \times 2016$ .
2. Simplify:  $40 \times \frac{1}{8} + 40 \div \frac{1}{8} + 40 \times \frac{1}{5} + 40 \div \frac{1}{5}$ .
3. Simplify the following:
  - (a)  $[5.3 + (-7.5)] - (-1.4 - 2.6) \times (-0.5)$
  - (b)  $(3 + 5)^2 - (17 - 5)^2 \div 2\frac{2}{5}$
4. Simplify if possible. If the answer is undefined, state so.
  - (a)  $\frac{(3 - 5)^2 - (7 - 13)}{(2 - 5) \times 3 + 2 \times 4}$
  - (b)  $\frac{6^3 - 7 \times 3^4 - 2^5 \times 9}{(1 - 2^3)^3 + 7^3}$
5. Find the value of square roots:
  - (a)  $\sqrt{3^2 + 4^2}$
  - (b)  $\sqrt{5^2 + 12^2}$
  - (c)  $\sqrt{15^2 + 8^2}$
  - (d)  $\sqrt{10^2 - 6^2}$
  - (e)  $\sqrt{25^2 - 7^2}$
  - (f)  $\sqrt{41^2 - 9^2}$
6. Find the value of cubes or cube roots:
  - (a)  $5^3$
  - (b)  $(-5)^3$
  - (c)  $-5^3$
  - (d)  $-(-5)^3$
  - (e)  $\sqrt[3]{512}$
  - (f)  $\sqrt[3]{-729}$
7. Identify rational and irrational number from the following list:  
 $\frac{1}{7}, \frac{3}{10}, 1.2, 0.\overline{27}, 0.24\overline{5}, \sqrt{4}, \sqrt{3}, \sqrt{8}, \sqrt{5}, \sqrt{\frac{1}{16}}$
8. Given  $\sqrt{5.73} \approx 2.394$ ,  $\sqrt{57.3} \approx 7.570$ , calculate  $\sqrt{5730}$  (use calculator to verify your answer).
9. Find the value of  $\sqrt{1\frac{9}{16} + \frac{9}{5} \div 1\frac{1}{5}}$ .
10. Evaluate  $\frac{42a^3b^7}{35a^2b^7}$  if  $a = \frac{5}{4}, b = \frac{2016}{2017}$ .