RATIONAL NUMBERS

Order in the Set of Rational Numbers

REMEMBER

The top part of a fraction is called the numerator and the bottom part is called the denominator. When the numerators of fractions are the same, the smallest fraction will have the largest denominator.

Examples: $\frac{3}{7}, \frac{3}{11}, \frac{3}{5}, \frac{3}{4}$ $\frac{3}{11}$ is the smallest fraction.

To compare unlike fractions:

Example: Multiply $\frac{2}{3} \times \frac{4}{7}$ The smallest answer is the smallest fraction.

$14 \quad 12$

$\frac{4}{7}$ is the smallest fraction.

1. Which fraction has the largest value?

   (a) $\frac{9}{10}$ (c) $\frac{3}{4}$

   (b) $\frac{3}{5}$ (d) $\frac{5}{8}$

_____

2. Which fraction has the smallest value?

   (a) $\frac{2}{5}$ (c) $\frac{1}{3}$

   (b) $\frac{1}{4}$ (d) $\frac{1}{2}$

_____

3. Choose the fraction that has the largest value.

   (a) $\frac{7}{8}$ (c) $\frac{5}{9}$

   (b) $\frac{3}{4}$ (d) $\frac{2}{3}$

_____

4. Choose the fraction that has the smallest value.

   (a) $\frac{1}{6}$ (c) $\frac{1}{7}$

   (b) $\frac{1}{3}$ (d) $\frac{1}{8}$

_____

5. When listed in order from smallest to largest, which fraction would be first?

   (a) $\frac{2}{3}$ (c) $\frac{2}{9}$

   (b) $\frac{2}{5}$ (d) $\frac{2}{7}$

_____

6. Which fraction has the largest value?

   (a) $\frac{5}{6}$ (c) $\frac{5}{8}$

   (b) $\frac{5}{7}$ (d) $\frac{5}{9}$

_____

7. Choose the fraction with the smallest value.

   (a) $\frac{2}{5}$ (c) $\frac{1}{4}$

   (b) $\frac{1}{10}$ (d) $\frac{1}{2}$

_____

8. When listed in order from smallest to largest, which fraction would be last?

   (a) $\frac{1}{5}$ (c) $\frac{1}{3}$

   (b) $\frac{1}{4}$ (d) $\frac{1}{2}$

_____

Prime Numbers

REMEMBER

A prime number can be divided only by 1 and the prime number itself.

Example: $13 \div 1 = 13$
$13 \div 13 = 1$

13 is a prime number.

A number that is not prime is composite.

1. Which is a prime number?

   (a) 6 (c) 4
   (b) 3 (d) 8

2. What is the largest prime number less than 10?

3. Choose the prime number.

   (a) 11 (c) 18
   (b) 12 (d) 16

4. What is the smallest prime number?

5. Which is a prime number?

   (a) 30 (c) 45
   (b) 14 (d) 5

6. Name a prime factor of 40.

7. Choose a prime number between 35 and 40.

8. Which is <u>not</u> a prime number?

   (a) 17 (c) 10
   (b) 29 (d) 31

9. What is a prime number between 45 and 50?

10. Choose the prime number.

    (a) 46 (c) 200
    (b) 55 (d) 101

11. What is the largest composite number less than 5?

12. Which is a prime number?

    (a) 40 (c) 75
    (b) 23 (d) 81

13. Which is a composite number?

    (a) 51 (c) 41
    (b) 47 (d) 53

14. Name a composite number between 56 and 60.

Reducing Fractions

REMEMBER

Reduce means to divide both the numerator and denominator of the fraction by the largest number possible.

Example: $\frac{12}{15} \div \frac{3}{3} = \frac{4}{5}$

1. Reduce to lowest terms:

   (a) $\frac{4}{8} =$ ___ (c) $\frac{12}{14} =$ ___

   (b) $\frac{7}{28} =$ ___ (d) $\frac{5}{20} =$ ___

2. Reduce to lowest terms:

   (a) $\frac{10}{15} =$ ___

   (b) $\frac{16}{24} =$ ___

3. Reduce to lowest terms:

   (a) $\frac{9}{12} =$ ___

   (b) $\frac{25}{75} =$ ___

   (c) $\frac{14}{49} =$ ___

4. Reduce to lowest terms:

   (a) $\frac{15}{18} =$ ___

   (b) $\frac{2}{22} =$ ___

5. Reduce to lowest terms:

   (a) $\frac{8}{56} =$ ___

   (b) $\frac{10}{90} =$ ___

6. Reduce to lowest terms:

   (a) $\frac{2}{12} =$ ___

   (b) $\frac{45}{60} =$ ___

7. Reduced to lowest terms, $\frac{6}{27}$ equals:

   (a) $\frac{12}{54}$ (c) $\frac{3}{9}$

   (b) $\frac{2}{9}$ (c) $\frac{1}{4}$

8. Reduced to lowest terms, $\frac{24}{36}$ equals:

   (a) $\frac{10}{12}$ (b) $\frac{5}{6}$

   (b) $\frac{2}{3}$ (d) $\frac{3}{4}$

Least Common Denominator

REMEMBER

The least common denominator means: find the smallest number each denominator divides into evenly.

Example: The least common denominator of $\frac{2}{5}$ and $\frac{7}{10}$ is 10.

The least common multiple means: find the smallest number that each of the given numbers divide into evenly.

Example: The least common multiple of 8, 6, 4 is 24.

1. What is the least common denominator of the fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{6}$?

   (a) 12 (c) 18
   (b) 6 (d) 24

   _____

2. Find the least common multiple of 6, 9, and 4.

   _____

3. What is the least common denominator of the fractions $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{2}{3}$?

   (a) 2 (c) 8
   (b) 3 (d) 24

   _____

4. What is the least common denominator of $\frac{2}{3}$, $\frac{5}{9}$, and $\frac{1}{6}$?

   _____

5. 48 is the least common denominator for which set of fractions?

   (a) $\frac{1}{6}$ and $\frac{2}{8}$ (c) $\frac{5}{16}$ and $\frac{1}{3}$

   (b) $\frac{1}{12}$ and $\frac{1}{4}$ (d) $\frac{7}{48}$ and $\frac{1}{5}$

   _____

6. What is the least common denominator of the fractions $\frac{2}{7}$, $\frac{1}{6}$, and $\frac{1}{2}$?

   _____

7. Find the least common multiple of 15, 10, and 3.

   _____

8. 72 is the least common denominator for which set of fractions?

   (a) $\frac{1}{12}$ and $\frac{5}{6}$ (c) $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{9}$

   (b) $\frac{5}{36}$ and $\frac{1}{2}$ (d) $\frac{7}{24}$, $\frac{1}{12}$, $\frac{5}{8}$

   _____

Greatest Common Factor

REMEMBER

The greatest common factor means: find the largest number that divides evenly into each of the given numbers.

Example: The greatest common factor of 6 and 9 is 3.

1. What is the greatest common factor of 20 and 30?

   (a) 2 (c) 20
   (b) 5 (d) 10

2. Find the greatest common factor of 12 and 18.

3. What is the greatest common factor of 16 and 20?

4. What is the greatest common factor of 16, 24, and 32?

5. 9 is the greatest common factor for which set of numbers?

   (a) 27 and 18 (c) 90 and 45
   (b) 36 and 72 (d) 45 and 60

6. Find the greatest common factor of 100 and 125.

7. What is the greatest common factor of 52, 26, and 39?

   (a) 26 (c) 2
   (b) 13 (d) 3

8. 5 is the greatest common factor for which set of numbers?

   (a) 15 and 45 (c) 55 and 75
   (b) 25 and 100 (d) 10 and 50

9. Find the greatest common factor of 14, 35, and 63.

10. The greatest common factor of 32 and 48 is

    (a) 12 (c) 16
    (b) 4 (d) 32

Changing Improper Fractions to Mixed Numbers

REMEMBER

To change an improper fraction to a mixed number, divide the denominator into the numerator.

Example: $\frac{22}{3} = 3\overline{)22} = 7\frac{1}{3}$ (7 with remainder 1; $\frac{21}{1}$)

1. Which is equal to $\frac{17}{4}$?

   (a) 4 (c) $4\frac{1}{4}$

   (b) $5\frac{3}{4}$ (d) 17

   _____

2. Choose the one that has the same value as $\frac{19}{5}$.

   (a) 5 (c) $4\frac{4}{5}$

   (b) $3\frac{4}{5}$ (d) 3

   _____

3. Change $\frac{11}{3}$ to a mixed number.

   _____

4. Which has the same value as $\frac{13}{2}$?

   (a) $4\frac{1}{2}$ (c) 7

   (b) 11 (d) $6\frac{1}{2}$

   _____

5. Change $\frac{27}{8}$ to a mixed number.

   _____

6. Choose the number that has the same value as $\frac{46}{7}$.

   (a) $6\frac{4}{7}$ (c) 8

   (b) $7\frac{4}{7}$ (d) $6\frac{2}{7}$

   _____

7. Change $\frac{37}{12}$ to a mixed number.

   _____

8. Change $\frac{32}{6}$ to a mixed number.

   _____

9. What is $\frac{47}{8}$ changed to a mixed number?

   _____

10. What is $\frac{74}{9}$ changed to a mixed number?

    _____

Changing Mixed Numbers to Improper Fractions

REMEMBER

To change a mixed number to an improper fraction: multiply the whole number times the denominator, add the numerator, then put your answer over the denominator.

Example: $5\frac{3}{4} = \frac{(5 \times 4) + 3}{4} = \frac{23}{4}$

1. Change $4\frac{3}{8}$ to an improper fraction.

2. Which has the same value as $2\frac{1}{2}$?

   (a) $\frac{7}{4}$ (c) $\frac{2}{5}$

   (b) $\frac{4}{2}$ (d) $\frac{5}{2}$

3. Which is equal to $6\frac{3}{4}$?

   (a) $\frac{27}{4}$ (c) $\frac{72}{4}$

   (b) $\frac{13}{4}$ (d) $\frac{4}{27}$

4. Change $7\frac{2}{5}$ to an improper fraction.

5. Change $5\frac{2}{11}$ to an improper fraction.

6. Which is equal to $2\frac{2}{3}$?

   (a) $\frac{3}{7}$ (c) $\frac{7}{3}$

   (b) $\frac{8}{3}$ (d) $\frac{3}{8}$

7. What is $6\frac{7}{8}$ changed to an improper fraction?

8. Find $10\frac{2}{7}$ changed to an improper fraction.

9. Which has the same value as $9\frac{5}{6}$?

   (a) $\frac{5}{54}$ (c) $\frac{45}{6}$

   (b) 59 (d) $\frac{59}{6}$

10. Change $8\frac{5}{9}$ to an improper fraction.

Addition of Fractions

REMEMBER

To add fractions with different denominators, first find the lowest common denominator and then add the numerators.

Example: $\frac{3}{4} + \frac{5}{6} =$

$$\frac{3}{4} = \frac{9}{12}$$
$$+ \frac{5}{6} = \frac{10}{12}$$
$$\frac{19}{12} = 1\frac{7}{12}$$

1. Add: $\frac{1}{2} + \frac{7}{8}$

_____

2. Add: $\frac{3}{5} + \frac{7}{10}$

_____

3. Add: $\frac{1}{6} + \frac{3}{4}$

_____

4. The sum of $\frac{9}{20}$ and $\frac{3}{5}$ is:

_____

5. Add: $\frac{7}{12} + \frac{2}{3}$

_____

6. The sum of $\frac{8}{15}$ and $\frac{4}{5}$ is:

_____

7. Add: $\frac{3}{4} + \frac{11}{16}$

_____

8. Add: $\frac{7}{10} + \frac{5}{8}$

_____

Addition of Mixed Numbers

REMEMBER

To add mixed numbers with different denominators, first find the lowest common denominator and then add:

Example: $3\frac{1}{2} + 2\frac{5}{8} =$

$$3\frac{1}{2} = 3\frac{4}{8}$$
$$+\ 2\frac{5}{8} = 2\frac{5}{8}$$
$$5\frac{9}{8} = 6\frac{1}{8}$$

1. Add:

$$1\frac{1}{2} + 6\frac{3}{8}$$

_____

2. Add:

$$5\frac{5}{9} + 3\frac{1}{6}$$

_____

3. Add:

$$9\frac{5}{6} + 16\frac{7}{8}$$

_____

4. The sum of $4\frac{2}{3}$ and $7\frac{4}{9}$ is:

_____

5. Add:

$$5\frac{2}{3}$$
$$+\ 6\frac{3}{4}$$

_____

6. Add:

$$29\frac{4}{15}$$
$$+\ 9\frac{2}{3}$$

_____

7. Add:

$$5\frac{1}{3}$$
$$+\ 8\frac{5}{6}$$

_____

8. Add:

$$29\frac{4}{5}$$
$$+\ 19\frac{2}{3}$$

_____

Addition of Mixed Numbers

REMEMBER

To add mixed numbers with different denominators, first find the lowest common denominator and then add:

Example: $3\frac{1}{2} + 2\frac{5}{8} =$

$$3\frac{1}{2} = 3\frac{4}{8}$$
$$+\ 2\frac{5}{8} = 2\frac{5}{8}$$
$$5\frac{9}{8} = 6\frac{1}{8}$$

1. Add:

$1\frac{1}{2} + 6\frac{3}{8}$

_____

2. Add:

$5\frac{5}{9} + 3\frac{1}{6}$

_____

3. Add:

$9\frac{5}{6} + 16\frac{7}{8}$

_____

4. The sum of $4\frac{2}{3}$ and $7\frac{4}{9}$ is:

_____

5. Add:

$5\frac{2}{3}$
$+\ 6\frac{3}{4}$

_____

6. Add:

$29\frac{4}{15}$
$+\ 9\frac{2}{3}$

_____

7. Add:

$5\frac{1}{3}$
$+\ 8\frac{5}{6}$

_____

8. Add:

$29\frac{4}{5}$
$+\ 19\frac{2}{3}$

_____

Subtraction of Fractions

REMEMBER

If the denominators are different, find the lowest common denominator before you subtract.

Example: Subtract $\frac{7}{16}$ from $\frac{7}{8}$

$$\frac{7}{8} = \frac{14}{16}$$
$$-\frac{7}{16} = \frac{7}{16}$$
$$\frac{7}{16}$$

1. Subtract $\frac{1}{8}$ from $\frac{3}{8}$.

_____

2. Subtract $\frac{3}{4}$ from $\frac{5}{6}$.

_____

3. Subtract: $\frac{7}{10}$ minus $\frac{1}{4}$

(a) $1\frac{13}{20}$ (c) $\frac{7}{10}$

(b) $\frac{6}{14}$ (d) $\frac{9}{20}$

_____

4. Subtract:
$$\frac{11}{15}$$
$$-\frac{2}{5}$$

(a) $\frac{1}{3}$ (c) $\frac{13}{20}$

(b) $\frac{7}{10}$ (d) $\frac{17}{15}$

_____

5. Subtract:
$$\frac{9}{10}$$
$$-\frac{1}{6}$$

(a) $\frac{16}{15}$ (c) $\frac{10}{16}$

(b) $\frac{11}{15}$ (d) $\frac{1}{6}$

_____

6. Find the difference of $\frac{5}{12}$ from $\frac{7}{9}$.

_____

7. Take $\frac{1}{3}$ from $\frac{7}{18}$.

_____

8. Find the difference of $\frac{1}{7}$ from $\frac{5}{6}$.

_____

Review

1. Which fraction has the largest value?

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

2. Which is a prime number?

   (a) 14 (b) 10 (c) 12 (d) 7

3. Reduce $\frac{15}{40}$ to lowest terms.

   (a) $2\frac{2}{3}$ (c) $\frac{3}{8}$

   (b) $\frac{3}{5}$ (d) $\frac{1}{3}$

4. What is the least common denominator of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$?

5. What is the greatest common factor of 12, 18, and 36?

   (a) 4 (b) 3 (c) 12 (d) 6

6. Change $\frac{14}{5}$ to a mixed number.

7. Change $5\frac{3}{8}$ to an improper fraction.

8. Add: $\frac{3}{5} + \frac{4}{9}$

9. Add: $4\frac{2}{3} + 5\frac{3}{4}$

   (a) $9\frac{1}{12}$ (c) $10\frac{5}{12}$

   (b) $1\frac{1}{12}$ (d) $9\frac{5}{12}$

10. Subtract: $\frac{5}{6} - \frac{2}{5}$

11. Subtract $\frac{1}{4}$ from 7.

12. From $14\frac{1}{8}$ subtract $6\frac{5}{6}$.