Skill Builder 1.1
Fractions

1. Circle the fractions that are in lowest terms.
   a. $\frac{9}{16}$  b. $\frac{3}{51}$  c. $\frac{14}{17}$  d. $\frac{9}{8}$  e. $\frac{12}{18}$  f. $\frac{15}{40}$

2. Match the improper fractions to its equivalent mixed number or whole number.

   _____  $\frac{2}{5}$  a. $\frac{17}{3}$
   _____  $\frac{4}{9}$  b. $\frac{13}{2}$
   _____  $\frac{1}{4}$  c. $\frac{23}{12}$
   _____  $\frac{2}{3}$  d. $\frac{13}{9}$
   _____  $\frac{1}{2}$  e. $\frac{18}{6}$
   _____  $\frac{3}{2}$  f. $\frac{25}{6}$
   _____  $\frac{11}{12}$  g. $\frac{17}{5}$
   _____  $\frac{4}{6}$  h. $\frac{9}{4}$

3. Fill in the blanks with the correct word or words.
   a. In order to divide fractions, _______________ by the _______________ of the divisor.
   b. When adding or subtracting fractions, fractions must have a ________________.
   c. A ______________ number is a number with factors other than itself and 1.
Skill Builder 1.2
The Real Numbers

Put each number below in the column(s) where it belongs:

1. \( \left\{ -18, -4.3, -\frac{1}{3}, 0, 2.8, \frac{17}{19}, \pi, 32, \sqrt{14} \right\} \)

2. \( \left\{ -\sqrt{10}, 15, 13, \frac{3}{8}, -42, \sqrt{3}, 22.7, -5.4, 1 \right\} \)

<table>
<thead>
<tr>
<th>NATURAL</th>
<th>WHOLE</th>
<th>INTEGERS</th>
<th>RATIONAL</th>
<th>IRRATIONAL</th>
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Use >, <, or = to compare the numbers.

3. -14 □ -23
4. -18 □ \( |18| \)
5. \( \frac{4}{3} \) □ \( \frac{7}{6} \)
6. \( |-9| \) □ 9
7. \( -\frac{3}{8} \) □ \( -\frac{3}{4} \)

True or False

8. A number can be rational and irrational.

9. Absolute value is always positive.

10. All natural numbers are also whole numbers.

11. All integers are positive.

12. Whole numbers are sometimes irrational.
1. Plot the given points in a rectangular coordinate system.
   a. (2, 2)  
   b. (3, $-\frac{5}{2}$)  
   c. (-1, -3)  
   d. (0, 4)  
   e. (-1, 4)  
   f. (4, -1)  
   g. (-3, 0)  
   h. (0, -2)  
   i. (1, 1)

2. Circle the answers below that will make each statement true:
   
   a. In quadrant I, the first coordinate is (positive, negative), the second coordinate is (positive, negative).
   
   b. In quadrant (I, II, III, IV) the first coordinate is negative, the second coordinate is positive.
   
   c. Ordered pairs that lie on the x-axis have zero as the value of the (x coordinate, y coordinate).
   
   d. In quadrant IV, the first coordinate is positive, the second coordinate is (positive, negative).
   
   e. Ordered pairs that lie on the y-axis have zero as the value of the (x-coordinate, y-coordinate).
Skill Builder 1.4
Basic Rules of Algebra

1. Circle the like terms in each row.
   a. 18  4x  3y  \( -x \)  6\( x^2 \)  \( -3x \)
   b. 5\( x^2 \)  12  4\( y^2 \)  4  3y  5x
   c. 21y  5xy  6\( y^3 \)  2\( y^2 \)  3xy  \( -xy \)

2. Match each example to its property.
   a. 6(5x) = (6 \cdot 5)x
   b. 20 + x + 4 = 20 + 4 + x
   c. 8(a + 3) = 8a + 24
   d. 4 \cdot x \cdot 3 = 4 \cdot 3 \cdot x
   e. (x + 10) + 20 = x + (10 + 20)

3. Match each expression to its simplified form.
   a. 4x + 8y
   b. 3x + 2y + 4
   c. \(-2x + 6y + 2\)
   d. 6y + 6
   e. \(-2y + 36\)
Skill Builder 1.5
Addition of Real Numbers

Match each algebraic expression to its simplified form.

_____ 1. \(-5x + 7x\)  
   a. \(-2\)

_____ 2. \(-3x + (–9x)\)  
   b. \(-5x + 5y\)

_____ 3. \(-2(4y + 18)\)  
   c. cannot be simplified

_____ 4. \(3 + (–5)\)  
   d. \(-2y + 6\)

_____ 5. \(7x + (–3y) + (–x) + 8y\)  
   e. \(4x\)

_____ 6. \((–3x) + 5x + 10y\)  
   f. \(-x\)

_____ 7. \(3x + 4y\)  
   g. \(6x + 24\)

_____ 8. \(2 + (–4) + 6x\)  
   h. \(10x + 16\)

_____ 9. \(6(x + 4)\)  
   i. \(x\)

_____ 10. \(-8(3x + 4y)\)  
   j. \(-24x + –32y\)

_____ 11. \(x + (–5x) + 3x\)  
   k. \(6x + (–2)\)

_____ 12. \(-10x + 5(x + y)\)  
   l. \(2x\)

_____ 13. \(9( x + 1) + x + 7\)  
   m. \(2x + 10y\)

_____ 14. \(6x + (–5x)\)  
   n. \(6x + 5y\)

_____ 15. \(3(x +4) + 4(x +1)\)  
   o. \(7x + 16\)

_____ 16. \(3x + (–4x) +5x\)  
   p. \(-12x\)

_____ 17. \(-9y + 4y + 3(2 + y)\)  
   q. \(-8y + –36\)
Skill Builder 1.6
Subtraction of Real Numbers

To subtract numbers, change to addition of the opposite first, then apply the rules for adding numbers. Never change the sign of the first number.

Subtract

1. 8 – 14
2. 10 – (–12)
3. –5.3 – 12
4. 420 – 532
5. 57 – (–13)
6. –18 – 12
7. –25 – (–29)
8. \[ -\frac{7}{12} - \left( -\frac{5}{12} \right) \]
9. \[ \frac{3}{8} - \frac{3}{8} \]
10. –212 – 33
11. 14 – 12 – (–16)
12. –35 – 15 – 7

Simplify.

13. 5y – 8 – y + 12
14. a^2 – 2 – 5a^2 + 8 + 7a^2
15. 4(x + 2) – 3(x + 4)

17. Jane had $125 in her checking account. She wrote checks in the amounts of $12.82, $6.41, and $8.06. What is her account balance now?
Perform the indicated operations, simplify if possible.

1. \((3)(-4) = \) _________________
2. \(-24 \div -6 = \) _________________
3. \((-2)(5)(-8)(15)(0)(-5) = \) _________________
4. \(0 \div 8 = \) _________________
5. \((-3)(4)(-1)(-5) = \) _________________
6. \(12 \div 0 = \) _________________
7. \(-\frac{3}{4} \times \frac{-6}{5} = \) _________________
8. \(-3(x - 4) = \) _________________
9. \(- (5y + 4) = \) _________________
10. \(2(x + 5) - 4(2x - 3) = \) _________________
11. \(2x + x + 5x = \) _________________
12. \(-5 \left(-\frac{1}{5}\right) = \) _________________
13. \(-x + x = \) _________________
14. \(7x + 3(x + 4) = \) _________________
15. \(22.2 \div -2 = \) _________________
16. \(-50 \div -10 = \) _________________
17. \((4)(-3)(-1)(2) = \) _________________
18. \(3(x - 6) = \) _________________
19. \(-5(y + 4) = \) _________________
20. \(-3 \div \left(\frac{6}{5}\right) = \) _________________
Skill Builder 1.8
Exponents, Order of Operations, and Mathematical Models

An exponent indicates the number of times a base should be used as a factor. Remember, never multiply the base and the exponent together.

Choose the correct answer:

1. \(-7^2\)  
   a. 49  
   b. \(-14\)  
   c. \(-49\)

2. \((-4)^3\)  
   a. \(-12\)  
   b. \(-64\)  
   c. 64

3. \(3^2 + 2^3\)  
   a. 12  
   b. 14  
   c. 17

4. \(5x - 3 - x + 2\)  
   a. \(4x - 1\)  
   b. \(4x - 5\)  
   c. \(5x + 1\)

5. \((4 + 2)^3\)  
   a. 20  
   b. 12  
   c. 36

6. \(\frac{5 + 3^2}{1 - (-1)}\)  
   a. undefined  
   b. 7  
   c. \(\frac{11}{2}\)

7. \(14 - 2 \cdot 3 - 8\)  
   a. 0  
   b. 13  
   c. \(-35\)

8. \(6^2 \div 2 \cdot 3 - 2^3\)  
   a. \(-6\)  
   b. 46  
   c. 10

9. \(3a + 8 - 5a - 3\)  
   a. \(-2a + 5\)  
   b. \(2a + 5\)  
   c. \(2a - 5\)

10. \((-2)^3 - 2^3\)  
    a. \(-14\)  
    b. 2  
    c. \(-16\)

Remember the sentence – Please Excuse My Dear Aunt Sally – to help you remember the order of operation.