

➤ Vocabulary List: Students should be able to *define* each term and provide an *example* that demonstrates understanding.

- Variable
  
- Coefficient
  
- Constant
  
- Natural/counting numbers
  
- Whole numbers
  
- Integers
  
- Rational numbers
  
- Irrational numbers
  
- Real numbers
  
- Inequality
  
- Sum
  
- Difference
  
- Product

- Quotient
- Absolute value
- Term
- Algebraic expression
- Equation
- Factor(n.)
- Distribute
- Reciprocal
- Least common denominator / least common multiple
- Base
- Exponent
- Solve
- Simplify
- Evaluate

The following problems involve the major topics that are expected of incoming students for Honors Algebra 1. All questions are to be completed **WITHOUT** a calculator. Students should show all relevant work along with their answers.

➤ **Topic:** Students should be able to follow the Order of Operations to simplify expressions.

Simplify the following expressions. Answers should be written as reduced fractions (NO DECIMALS!)

1)  $4^2 \div (6+2) - (7-11)^2$

2)  $\frac{2}{5}(10+5) - \frac{3}{4}(2^2)$

3)  $\frac{3+2 \cdot 3}{(8-3)+4}$

4)  $\frac{6-6 \cdot 6}{5-5}$

5)  $|15-28|$

6)  $2|-5|-|3|$

7)  $\left| -\frac{5}{6} - \frac{3}{10} \right|$

8)  $\frac{3}{18} + \frac{5}{18}$

9)  $\frac{2}{7} - \frac{3}{4}$

10)  $\frac{1}{6} + \frac{5}{3}$

11)  $\frac{14}{39} \cdot \frac{13}{7}$

12)  $\frac{22}{5} \div \frac{11}{10}$

13)  $-\frac{10}{3} \div 15$

14)  $\frac{21}{32} + (-5)$

15)  $-\frac{7}{3} \cdot \left( -\frac{12}{35} \right)$

16)  $(-6)^2$

17)  $-6^2$

18)  $-(-6)^2$

19)  $\frac{20}{\frac{5}{\frac{4}{4}}}$

20)  $-|-8 \cdot (4)|$

21)  $-\frac{17}{45} - \frac{23}{24}$

22) 
$$\frac{\frac{4}{4^2-1} - \frac{3}{5 \cdot (7-5)}}{\frac{-(2)^2}{4 \cdot 7 + 2}}$$

➤ **Topic:** Students should be able to use the distributive property and combine like terms.

Simplify the following expressions.

23)  $-2(x-6)$

24)  $\frac{5}{2}(8m+3)$

25)  $-10x+6+4x-x+1$

26)  $-x-3x^2+4x-x^2$

27)  $-4(w-3)-(2w+1)$

28)  $\frac{2}{5}(5x-10)+\frac{1}{4}(8x+4)$

29)  $\frac{4}{3}(5y+1)-\frac{2}{5}(3y-4)$

30)  $\frac{1}{4}\left(\frac{2}{3}x-\frac{1}{2}\right)+\frac{1}{10}\left(\frac{5}{2}x-\frac{15}{4}\right)$

➤ **Topic:** Students should be able to approximate numbers by rounding.

Round 36.7158 to the nearest:

31) tenth

32) hundredth

33) thousandth

➤ **Topic:** Students should be able to calculate the distance between points on the number line using absolute value.

34) Plot the points  $P = 12$  and  $Q = 26$  on the real number line. If  $d(P, Q)$  represents the distance between  $P$  and  $Q$ , find  $d(P, Q)$ .

35) Plot the points  $P = -13$  and  $Q = 7$  on the real number line. If  $d(P, Q)$  represents the distance between  $P$  and  $Q$ , find  $d(P, Q)$ .

➤ **Topic:** Students should be able to translate English expression into the language of mathematics.

Express each English phrase using an algebraic expression.

36) The sum of 5 and a number  $x$ . \_\_\_\_\_

37) The difference of 10 and a number  $y$ . \_\_\_\_\_

38) The product of 4 and a number  $z$ . \_\_\_\_\_

39) The ratio of a number  $x$  and 5. \_\_\_\_\_

40) A number  $w$  decreased by 7. \_\_\_\_\_

41) Twice the sum of a number  $m$  and 4. \_\_\_\_\_

42) 4 more than twice a number  $m$ . \_\_\_\_\_

43) The sum of a number  $x$  and 5 divided by 6. \_\_\_\_\_

44) Three less than five times a number  $p$ . \_\_\_\_\_

45) The quotient of some number  $y$  and 3 increased by the product of 6 and some number  $x$ . \_\_\_\_\_

➤ **Topic:** Students should be able to evaluate an expression if given the value of a variable.

Evaluate each expression for the given value of the variable.

46)  $-5x+1$  for  $x=3$

47)  $y^2-3y+7$  for  $y=-2$

48)  $\frac{4z+3}{z^2-4}$  for  $z=3$

49)  $|15k+10|$  for  $k=-\frac{3}{5}$

50)  $\frac{3-5m}{(m-4)^2}$  for  $m=4$

51)  $\frac{2x^2+5x+2}{x^2+5x+6}$  for  $x=3$