HSML Algebra I Course Preparedness Test

High School Math Live wants parents to be well informed. We want your student to be placed in the appropriate course so that they will be successful and challenged while learning the beauty of mathematics. The questions we have below will be a good indicator to whether your student is ready for Algebra I. Completing approximately 80% correctly is a good sign that your student is ready for this course. If your student struggles with the majority of the questions, then you and your student will need to discuss your plans. Will your student simply need to allow more time for math this year? Will your student need a private tutor? Will your student put forth the effort needed in order to be successful? We cannot answer these questions for you, but we want you to know prior to the school year what skills are needed for this course.

The answer key is provided at the end of the document. We ask that you sit down with your student and discuss their work. It is very important that you are aware of their results so that informative decisions can be made. After completing these problems, if you find that there are concepts that your student has not mastered, our Brush Up on Math workshops would be a great way to get targeted help on those concepts. If you feel that input from an instructor of the course would be helpful, please scan their work and answers, making sure that the answers are in the same order as the problems on the document. The scan should be emailed as a single PDF document to support@highschoolmathlive.com.

Please view our website, www.highschoolmathlive.com, to read other details including what makes a successful HSML student and online learner.

For these questions, no calculator should be used.

Part 1. Simplify the following.

1. $2.67 - 5.4$
2. 2^4
3. 0.23×10^2
4. $7 + 3 \cdot 4$
5. $4(2+7) \div 2$
6. $|-3|$
7. $\frac{42}{7}$

Part 2. Find the next numbers in the sequence.

1. $-15, -9, -3, 3, \ldots$
2. $-2, 1, -\frac{1}{2}, \frac{1}{4}, \ldots$

Part 3. Number Questions

1. Are these expressions equivalent? $(2 \times 3) \times 5$ and $2 \times (3 \times 5)$
2. What is the greatest common factor of 18, 24 and 36?

Part 4. Algebraic Expressions

1. Translate this statement: 5 less than the product of x and y.
2. Simplify: $3(x - 4)$

Part 5: Solve for x.

1. $\frac{2}{x} = \frac{7}{6}$
2. $x = -\frac{1}{2} + \frac{3}{8}$
3. $x - 4 = -10$
4. $3x - 1 = 14$
5. $2x + 3 = 11$

Part 6. Fractions/Decimals/Percents

1. Is $\frac{15}{20}$ equivalent to $\frac{3}{4}$?
2. What is the improper fraction for $3\frac{3}{8}$?
3. What is the repeating decimal that is equivalent to $\frac{7}{9}$?
4. What is the decimal that is equivalent to $5\frac{2}{5}$?
5. What is the least common denominator for $\frac{3}{4}$ and $\frac{2}{3}$?
6. What is the fraction representation of 3%?
7. 60 is what percent of 300?
8. 30 % of 600 people are attending a school event. How many people are attending?

Part 7. Evaluate the following expressions with the given values.

1. $4x-2y$ if $x=5$ and $y=3$
2. $\dfrac{x(2y+z^2)-2z}{x+2y}$ if $x=5$, $y=2$ and $z=-1$

Part 8. Miscellaneous Problems

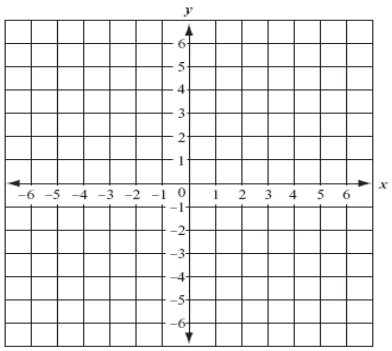
1. If our class can paint 8 pictures in 12 hours, write the simplified ratio comparing pictures to hours.

2. I will be making $4\frac{1}{2}$ inch cloth strips to go along one edge of a quilt. My quilt edge measures 81 inches. How many strips will I use if they are placed end to end along the edge?

3. The area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Find the area of a trapezoid if the height is 4 inches and the bases are 1.2 inches and 6.3 inches.

4. The area of a circle is $A = \pi r^2$. Use 3.14 for π and find the area of a circle if the radius length is 3 inches.

5. Plot the following points on the provided grid.
   A (-2, -1) B (4, -5) C (-6, 3) D (3, 2)



Part 9. Geometry

1. What is the perimeter of this rectangle?

2. The figure is a square with side length $3\frac{1}{2}$ inches. What is the area of this square?

Answer Key:

Part 1

1. -2.73
2. 16
3. 23
4. 19
5. 18
6. 3
7. 6

Part 2

1. 9
2. $-\frac{1}{8}$

Part 3

1. Yes
2. 6

Part 4

1. $xy-5$
2. $3x-12$

Part 5

1. $\frac{12}{7}$
2. $-\frac{1}{8}$
3. -6
4. 5
5. 4

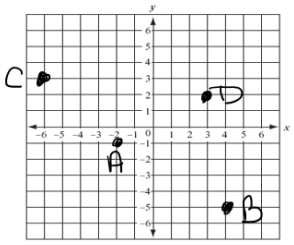
Part 6

1. Yes
2. $\frac{27}{8}$
3. $0.\overline{7}$
4. 5.4
5. 12
6. $\frac{3}{100}$
7. 20%
8. 180 people

Part 7

1. 14
2. 3

Part 8

1. $\frac{2}{3}$
2. 18 strips
3. 15 in^2
4. 28.26 in^2
5. 

Part 9

1. 26.64 ft
2. 12.25 in^2