

IMMACULATE CONCEPTION HIGH SCHOOL

HONORS ALGEBRA I

SUMMER REVIEW

This packet contains problems that we as a mathematics department feel you should know from previous math courses. It is important that you review these problems since they will appear throughout this course. We feel this will give you an advantage when beginning Honors Algebra I, and it will guide your teacher as to what you know and in what areas you may need extra help.

This packet must be completed prior to the beginning of the school year. It is recommended that you begin working on this review early August in order to better retain the material. Do your best on these problems, looking in old math books, old notes or using the internet will help guide you. All work must be shown when working each problem. It is very important that you practice your basic skills without a calculator, so please avoid the use of one. You will be given a practice test on the 2nd day of school and will then be retested at the end of the first week of school on the review packet. You will not be allowed to use a calculator on either test. Calculators will be used throughout the course as needed. All arithmetic must be done by hand.

Do all work on separate paper! Write the problems out and show all work. No calculator allowed. Write all answers in lowest terms. There are notes starting on the 3rd page that may be helpful in working these problems out.

1. Tell if each number is prime, composite or neither a) 98 b) 13 c) 0	2. Find the prime factorization of the following numbers. a) 24 b) 100 c) 54	3. Write the fraction in lowest terms. a) $\frac{12}{15}$ b) $\frac{50}{125}$ c) $\frac{36}{48}$	4. Write the improper fraction as a mixed number. a) $\frac{64}{7}$ b) $\frac{48}{5}$	5. Write the mix number as an improper fraction. a) $3\frac{2}{5}$ b) $12\frac{14}{20}$
6. Find the product or quotient of each. a) $\frac{11}{25} \cdot \frac{30}{22}$ b) $\frac{12}{40} \div \frac{24}{10}$ c) $4\frac{3}{8} \cdot 2\frac{4}{8}$ d) $5\frac{4}{9} \div 3\frac{2}{3}$	7. Find each sum or difference. a) $\frac{23}{45} + \frac{47}{75}$ b) $\frac{12}{13} - \frac{5}{26}$ c) $12\frac{5}{6} - 7\frac{7}{8}$ d) $5\frac{4}{9} + 8\frac{1}{3}$	8. Add or Subtract. a) $234.5 + 34.56$ b) $12.023 - 11$ c) $0.23 + 1.46 - 0.046$ d) $689 - 79.832$	9. Multiply or Divide. a) $1.464 \times .16$ b) $429.2 \div 0.3$ c) 23.45×0.002 d) $0.428 \div 0.2$	10. Write fraction as a decimal. a) $9/16$ b) $151/200$ c) $2\frac{8}{16}$
11. Convert each percent to a decimal. a) 27.5% b) 100% c) 56%	12. Convert each decimal to a percent. a) 0.0409 b) 3.45 c) 56.423	13. Find the value of each exponential expression. a) 3^3 b) $(\frac{2}{3})^4$ c) -2^2 d) $(-2)^2$	14. Find the value of each expression. a) $6^2 \div 3^2 - 4 \cdot 3 - 2 \cdot 5$ b) $19 - 3[8(5 - 2) + 6]$ c) $\frac{2^2 + 5 \div 3}{9 \cdot 27 \div 3}$	15. Write each word statement in symbols. a) seven equals thirteen minus six. b) one more than three times a number. c) 17 less than nine times a number.
16. Write each word sentence as an equation. a) The sum of five times a number and two is 23 b) Ten divided by a # is two more than the #	17. Find the value of each expression if $x = 2$ And $y = 4$. a) $\frac{3x}{4} - \frac{3y}{2}$ b) $9x - 3y + 2$	18. Decide whether the given number is a solution of the equation. a) $6b + 2(b + 3) = 14; 2$ b) $\frac{4-x}{x+2} = \frac{7}{5}; \frac{1}{2}$	19. Identify as an expression or an equation. a) $4x + 2y + 7$ b) $y^2 - 7y + 4 = 0$ c) $\frac{4-x}{5}$	20. Select the smaller number in each pair. a) -5.99, -6.01 b) $-(-4)$, -4 c) $-2/5$, $-1/4$
21. Find the absolute value of each. a) $- 49 - 39 $ b) $ -7.52 + 6.3 $	22. Find each sum. a) $-20 + (-20)$ b) $-2\frac{3}{8} + (-3\frac{1}{4})$ c) $\frac{5}{14} + \frac{7}{28}$	23. Find the difference. a) $8 - 5$ b) $7 - 10$ c) $4 - 4$ d) $-7 - (-14)$ e) $\frac{1}{10} - \frac{1}{12}$	24. Perform each operation. a) $[3 - (-9)] - (-6)$ b) $\frac{2}{9} - [\frac{5}{6} - (-\frac{2}{3})]$	25. Use order of operations to simplify. a) $-14 + 3 + [8 + (-13)]$ b) $\frac{3}{8} + [-\frac{2}{3} + (-\frac{7}{12})]$
26. Find each product. a) $12(-32)$ b) $(-14)(-22)$ c) $(-0.42)(-3.4)$ d) $(-2/3)(15/24)$ e) $(-2\frac{1}{2})(-3\frac{1}{5})$	27. Find each quotient. a) $-\frac{3}{16} \div \frac{9}{8}$ b) $5.5 \div (-2.2)$ c) $2\frac{1}{4} \div 5\frac{2}{3}$	28. Perform the indicated operations. a) $-4[(-2)(7) - 2]$ b) $\frac{(-9+1)^2 - (-6)(-2)}{5(-5)+3(4)}$	29. Use the distributive property to simplify. a) $-(4b - 8)$ b) $n(2a - 4b + 6c)$ c) $2(7x) + 2(8z)$	30. Evaluate if $x = -3$; $y = 2$ and $a = 4$ a) $-x + [(-a + y) - 2x]$ b) $(-4 + x)(-a) - x $

<p>31. Simplify each.</p> <p>a) $4(2x + 5) + 7$</p> <p>b) $7(5n - 2) - (6 - 11)$</p> <p>c) $7r - (2r + 4)$</p>	<p>32. Solve each equation by adding or subtracting on each side.</p> <p>a) $y - 4 = 16$</p> <p>b) $p - \frac{2}{3} = \frac{5}{6}$</p> <p>c) $x + 16 = -78$</p>	<p>33. Solve each equation by division.</p> <p>a) $8x = 24$</p> <p>b) $-20y = -100$</p> <p>c) $15z = -45$</p>	<p>34. Solve each eq. by mult. the recipricol to each side.</p> <p>a) $\frac{b}{5} = 4$</p> <p>b) $\frac{6}{7}y = \frac{2}{3}$</p> <p>c) $1\frac{2}{3}x = \frac{5}{7}$</p> <p>d) $\frac{25}{3} = \frac{125}{x}$</p>	<p>35. Solve by combining like terms.</p> <p>a) $3w - 7w = 20$</p> <p>b) $7t + 6t = 11 - 4$</p> <p>c) $\frac{3}{8}y - \frac{1}{3}y = \frac{1}{12}$</p> <p>d) $5.7x + 12.8x = 4.7$</p>
<p>36. Solve multi-step equations.</p> <p>a) $2a + 6 = 5a - 6$</p> <p>b) $-12x - 5 = -3x + 2$</p> <p>c) $12.3y + 2.5 = 1.3y - 5$</p>	<p>37. Solve multi-step equations.</p> <p>a) $\frac{2}{3}x + \frac{1}{2} = \frac{4}{3}x - \frac{1}{6}$</p> <p>b) $\frac{1}{2}x - \frac{1}{6}x + 3 = 2 + \frac{1}{6}x + 1$</p>	<p>38. Perform the indicated operations.</p> <p>a) $(2x - 3) + (-4x - 5)$</p> <p>b) $(-5a + 2) - (4a - 2)$</p>	<p>39. Decide if the following pairs of ratios are equivalent.</p> <p>a) $\frac{25}{50}; \frac{24}{48}$</p> <p>b) $\frac{2}{6}; \frac{14}{86}$</p> <p>c) $\frac{18}{48}; \frac{25}{75}$</p>	<p>40. Solve each proportion.</p> <p>a) $\frac{24}{x} = \frac{4}{3}$</p> <p>b) $\frac{2m-1}{3} = \frac{m+1}{2}$</p> <p>c) $\frac{5k+1}{3k-2} = \frac{6}{3}$</p>
<p>41. Round 56.249 following decimal to the place value indicated.</p> <p>a) hundredths</p> <p>b) tenths</p> <p>c) ones or units</p> <p>d) tens</p>	<p>42. Round each decimal to nearest thousandths.</p> <p>a) $0.\bar{1}$</p> <p>b) 0.9543</p> <p>c) 0.3487</p>	<p>43. Graph each inequality on a # line.</p> <p>a) $x \geq -4$</p> <p>b) $y \leq 5$</p> <p>c) $a > 0$</p> <p>d) $b < -1$</p>	<p>44. Write the area formula's for the following.</p> <p>a) Square</p> <p>b) Rectangle</p> <p>c) Triangle</p> <p>d) Circle</p>	<p>45. Find the area of each.</p> <p>a) Square : sides = 3</p> <p>b) Rectangle: Length = 2 and width=4</p> <p>c) Triangle: base = 6 height = 8</p> <p>d) Circle: radius = 3</p>

There are notes on the following pages that can be helpful when working out these problems.

Notes for Honors Algebra I

Here is some information which should help you complete your summer review packet.

Adding & Subtracting Fractions:

- Find the Least Common Denominator (LCD).
- Rewrite each fraction with the common denominator.
- Decide what number is needed to multiply the original denominator to get the common denominator and multiply the same number to the numerator. Do this for both fractions.
- For the final answer, carry the common denominator over and either add or subtract the numbers in the numerator.

Example: $\frac{4}{24} + \frac{5}{16}$ The common denominator between 24 & 16 is 48.

$$\Rightarrow \frac{\quad}{48} + \frac{\quad}{48} \text{ Mult. the first fraction by 2 and the second one by 3.}$$

$$\Rightarrow \frac{8}{48} + \frac{15}{48} = \frac{23}{48} \text{ Now add the numerators together and carry over the denominator.}$$

Multiplying Fractions:

- Use the cross cancel method (**Not cross multiplication**).
- Take the numerator of the first fraction and the denominator of the second fraction and reduce each by the greatest common factor. Now do the same with the numerator of the second and denominator of the first.
- Now multiply the numerators together and then the denominators together.

Example: $\frac{4}{25} \cdot \frac{5}{16}$ The GCF of 4 & 16 is 4 and the GCF of 5 & 25 is 5.

$$\frac{1}{5} \cdot \frac{1}{4} = \frac{1}{20}$$

Dividing Fractions:

- Change the division sign to multiplication.
- Do the reciprocal of the second fraction.
- Follow the steps from multiplying fractions.

$$\text{Example: } \frac{25}{81} \div \frac{5}{9} \Rightarrow \frac{25}{81} \cdot \frac{9}{5} \Rightarrow \frac{5}{9} \cdot \frac{1}{1} = \frac{5}{9}$$

Adding & Subtracting mixed numbers

The steps are the same whether you're adding or subtracting mixed numbers:

- Find the [Least Common Denominator \(LCD\)](#)
- Find the equivalent fractions.
- Add or subtract the fractions and add or subtract the whole numbers.
- Write your answer in lowest terms.

Example: $9\frac{1}{2} + 5\frac{2}{3}$ $LCD = 2 \times 3 = 6$

$$\begin{array}{r} 9\frac{1}{2} \times \frac{3}{3} = 9\frac{3}{6} \\ + 5\frac{2}{3} \times \frac{2}{2} = 5\frac{4}{6} \\ \hline 14\frac{7}{6} = 15\frac{1}{6} \end{array}$$

1. $3 - \frac{1}{4}$ $3 = 2\frac{4}{4}$ "Borrow" a 1 from the 3 and change to $\frac{4}{4}$.

$$\begin{array}{r} 3 = 2\frac{4}{4} \\ - \frac{1}{4} = -\frac{1}{4} \\ \hline 2\frac{3}{4} \end{array}$$

2. $2\frac{1}{3} + 3\frac{1}{8}$ $2\frac{1}{3} = 2\frac{8}{24}$

$$\begin{array}{r} 2\frac{1}{3} = 2\frac{8}{24} \\ + 3\frac{1}{8} = + 3\frac{3}{24} \\ \hline 5\frac{11}{24} \end{array}$$

The LCD of 3 and 8 is 24.

Adding & Subtracting Decimals:

- Be sure to line the decimal points up correctly.
- Add or Subtract.

Example: $25.4 + 400.23 + 125.111 =$

$$\begin{array}{r} 25.4 \\ + 400.23 \\ + 125.111 \\ \hline 550.741 \end{array}$$

Multiplying Decimals:

- Don't line up the decimals. Line up the numbers.
- Place one number on top of the other and multiply.
- Count the number of decimal places and move that many places in you answer.

$$\begin{array}{r} 24.48 \\ \times \quad 2.3 \\ \hline 55.804 \end{array}$$

There are two decimal places on top and one decimal place on the bottom, totally three decimal places.

Dividing Decimals:

- Use long division.
- If the divisor has a decimal, then you must move the decimal until it's behind the last number.
- The same number of spaces you moved the decimal on the divisor is the same number of decimal places to move the decimal on the dividend.

Example: $2.4 \overline{)348.5}$ move the decimal one place to the right on the 2.4, then move the decimal one place to the right on 348.5.

$$24 \overline{)3485.0}$$

Writing a fraction as a decimal:

- Divide the numerator by the denominator.

$$\text{Example: } \frac{5}{24} = 0.208\bar{3}$$

Converting a percent to a decimal:

- Move the decimal two places to the left.

Example: $125.3\% \Rightarrow 1.23$ (this is the decimal form)

Converting a decimal to a percent:

- Move the decimal two places to the right.

Example: $.245 \Rightarrow 24.5\%$

Simplifying Exponents:

- 2^3 - the 2 is called the base number and the 3 is the exponent.
- Take the base number and multiply it by itself the number of times the exponent number is.

Example: $2^3 = 2 \cdot 2 \cdot 2 = 8$

Simplify an expression:

- An expression is made up of number and variable terms separated by addition or subtraction.

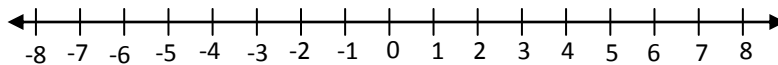
Example: $2x + 3y - 8$

- To simplify an expression use PEMDAS which stands for parentheses, exponents, multiplication, division, addition and subtraction.

Absolute Value:

- Absolute value is the distance from zero on a number line. Distance is always positive; therefore your answer will always be positive when taking the absolute value of a positive or negative number.

Example: $|3| = 3$ and $|-3| = 3$



3 & -3 are both 3 units from zero.

Combining like terms in an expression:

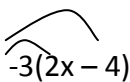
- To combine terms, make sure to add and sub. the terms with the same variable and exponent.

Example: $4x^2 - 6x + x - 9x^2 \Rightarrow$ Add the $4x^2$ & $-9x^2$ together. Then add the $-6x$ & x together.

Answer: $-5x^2 - 5x$

Distributive Property:

- The number on the outside of a set of parentheses must be multiplied by each number inside the parentheses.

Example: $-3(2x - 4) \Rightarrow$  $-3(2x - 4) = -6x + 12$

Solving different types of equations:

- An equation has an equation sign, where you must get an answer for the variable in the problem.
- Isolate the variable.

Examples:

1. $2x + 1 = 5$

Subt. 1 from both sides and then
Divide by 2 on both sides.

2. $5x - 3 = 2x + 5$

Get like terms together on the same side by adding or
Subt. $2x$ or $5x$. Then add or subt. -3 or 5 on both sides.
Divide both sides by the number left in front of x .

3. $x + 7 - 2x = 4x - 1$

Add like terms on the same side first.
The follow rules from #2.

4. $\frac{1}{4}x = \frac{5}{6}$

Either multiple both sides by $(4/1)$ the reciprocal
 $(1/4)$ or write as proportion and cross multiple.

5. $2x = \frac{1}{9}$

Put $2x$ over 1 and cross multiple or multiple by $(1/2)$ the reciprocal of 2.