

Key

# The Beginners Guide to Honors Algebra I

A Note To Our Students WELCOME! This packet is designed to help you make the transition into this challenging course as smooth as possible. The entire content of this suggested practice set will be covered in the first week of school.

Our suggestion: First look through the whole packet and read all the directions. Begin with the problems that you recognize and are confident with—you will notice that many problems are Pre-Algebra material.

For the concepts you are unfamiliar with: Impress us!! Show us your resourcefulness and see what you can find. Perhaps try an Algebra book, a math website, a classmate, relative, or anyone you know.

One thing is for sure: The more you do now, the easier it will be when school starts and the more comfortable you will feel with the pace of the class.

Instructions: Feel free to use a calculator to check a solution or two, but ALL problems are designed to be done without one. NEATLY show all your work for each problem. You are encouraged to try every problem. This is not a mandatory assignment but is designed to help maximize your success at the beginning of the school year. Bring the packet on the first day of class. We will collect it to see what skills we need to focus on in the first few weeks of the school year. We will also use this packet as examples when going over the first two chapters in the book. Give us your best work...while giving yourself the opportunity to get off to a great start.

WE LOOK FORWARD TO MEETING YOU IN AUGUST!!!

1. Give an example of:

- |  |  |
|--|--|
| a. An irrational number greater than one but less than two | a. <u><math>\sqrt{2}</math></u>                  |
| b. A non-integer   | b. <u>3.7, 4.2, ...</u>                          |
| c. An imaginary number                                     | c. <u><math>i, 2i, -3i, \dots</math></u>         |
| d. A negative odd number                                   | d. <u>-7, -11, ...</u>                           |
| e. A digit that is not a counting number                   | e. <u>0</u>                                      |
| f. A natural number that is negative                       | f. <u>Does not exist</u>                         |
| g. A real number that is also irrational                   | g. <u><math>\sqrt{3}, \sqrt{5}, \dots</math></u> |

2. Name all sets of numbers to which each of the following belongs:

- |                |   |
|----------------|---|
| a. -12         | a. <u>Real, Rational, Integer</u>                     |
| b. $\sqrt{21}$ | b. <u>Real, irrational</u>                            |
| c. 4           | c. <u>Real, rational, integer,<br/>whole, natural</u> |
| d. $\sqrt{-5}$ | d. <u>Imaginary</u>                                   |

3. Identify the property the statement illustrates.

- |                                |   |
|--------------------------------|---|
| a. $(4 + 9) + 3 = 4 + (9 + 3)$ | a. <u>Associative prop. of<br/>addition</u>       |
| b. $15 \cdot 1 = 15$           | b. <u>Identity prop. of<br/>multiplication</u>    |
| c. $5 + (-5) = 0$              | c. <u>Inverse prop. of<br/>addition</u>           |
| d. $6 \cdot 4 = 4 \cdot 6$     | d. <u>Commutative prop.<br/>of multiplication</u> |
| e. $7(2 + 8) = 7(2) + 7(8)$    | e. <u>Distributive<br/>property</u>               |

4. Carry out the indicated operations:

- |   |                                     |
|---|-------------------------------------|
| a. $15 + 3 - 21$                                    | a. <u>-3</u>                        |
| b. $52 \div 4 \cdot 11$                             | b. <u>143</u>                       |
| c. $35 - 15 \div 5 + 21$                            | c. <u>53</u>                        |
| d. $\frac{4^2+3}{5-9} \quad \frac{16 \div 3}{-4} =$ | d. <u><math>-\frac{4}{3}</math></u> |

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5. Simplify the following algebraic expressions:

a.  $2m^2 - 5n^2 + 6n^2 - 8m$

b.  $7(m-3) + 4(m+5)$

c.  $10(n^2 + n) - 6(n^2 - 2)$

d.  $y^2 + 2y + 3y^2$

a.  $2m^2 + n^2 - 8m$

b.  $11m - 1$

c.  $4n^2 + 10n + 12$

d.  $4y^2 + 2y$

6. Evaluate the following for  $x = -3$  and  $x = 5$ .

a.  $|3 - 2x|$

b.  $5x + 7$

c.  $2x^2 - 3x - 9$

a.  $9, 7$

b.  $-8, 32$

c.  $18, 26$

7. Solve each equation:

a.  $6m - 3 = 21$

b.  $3 = 2p + 5$

c.  $1 = \frac{1}{3}a - 5$

d.  $5b - 4 = 2b + 8$

e.  $2c + 14 = 6 - 4c$

f.  $3(2x - 5) - x = -7(x + 3)$

a.  $m = 4$

b.  $p = -1$

c.  $a = 18$

d.  $b = 4$

e.  $c = -\frac{4}{3}$

f.  $x = -\frac{1}{2}$

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g.  $\frac{1}{2}x + 4 = \frac{-2}{3}x + \frac{1}{2}$

g.  $x = -3$

h.  $3(x + 5) = 3x + 15$

h. All real numbers

i.  $-2(4 - 3x) + 7 = 6(x + 1)$

i. No solution

j.  $\frac{3x-14}{5} = 18$

j.  $x = \frac{104}{3}$  or  $34.\bar{6}$

k.  $\frac{x-5}{8} = \frac{2x+1}{3}$       $3(x-5) = 8(2x+1)$

k.  $x = \frac{-23}{13}$

8. Solve each equation for y

a.  $y - 6x = 7$

a.  $y = 6x + 7$

b.  $3x + 2y = 12$

b.  $y = -\frac{3}{2}x + 6$

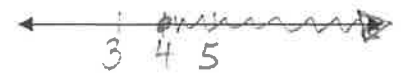
c.  $2x + 5y = -1$

c.  $y = -\frac{2}{5}x - \frac{1}{5}$

10. Solve, write the solution set, and graph on the number line in the given domain:

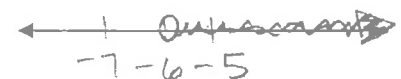
a.  $5x - 7 \geq 13$

a.  $x \geq 4$



b.  $4 - 3x < 22$

b.  $x > -6$



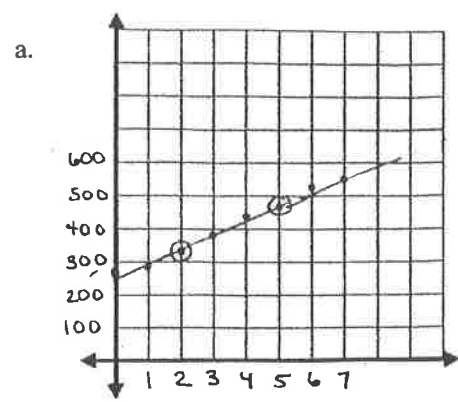
$$3x + 2y = 14$$

14. Approximate a line of best fit by following each step.

a. Draw a scatter plot of the data.

x	y
0	280
1	295
2	322
3	395
4	425
5	471
6	511
7	548

Answers will vary.



b. Sketch a line that appears to best fit the data

c. Choose two points that appear to lie on the line

$$\text{slope} = \frac{471 - 322}{5 - 2} = \frac{149}{3} = 49.\bar{6}$$

d. Write an equation of the line passing through the two points you chose in part (c).  $y - 322 = 49.\bar{6}(x - 2)$

$$y - 322 = 49.7x - 99.4$$

e. Use your equation from part (d) to predict y when x = 12

$$y = 49.7(12) + 222.6$$

$$y = 596.4 + 222.6$$

c. (2, 322) and (5, 471)

d.  $y = 49.7x + 222.6$

e.  $y \approx 819$

For the following problems (#12-16), be able to perform the indicated operations without using a calculator.

12.  $\frac{4}{5} - \frac{3}{7} = \frac{13}{35}$

13.  $-12 - 5 = -17$

14.  $4\frac{1}{7} \cdot \frac{2}{21}$

$$\frac{24}{21} = \frac{8}{7}$$

15.  $\frac{-23}{7} - 1\frac{2}{3}$

16.  $\frac{-5}{8} \div \frac{8}{9}$

$$3\frac{-23}{7} - \frac{5 \cdot 7}{3 \cdot 7} = \frac{-69}{21} - \frac{35}{21} = \frac{-104}{21}$$

$$-\frac{5}{8} \cdot \frac{9}{8} = \frac{-45}{64}$$

17. Find the slope of the line passing through the following points.

a. (2, -4) (4, -1)

a.  $m = 3/2$

b. (-3, 6) (-7, 3)

b.  $m = 3/4$

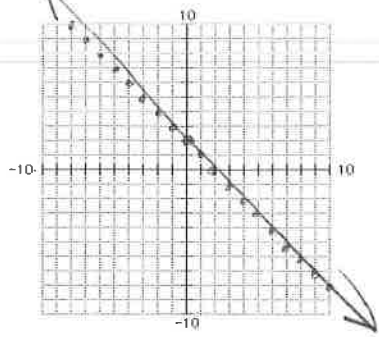
c. (4, 4) (4, 9)

c. undefined

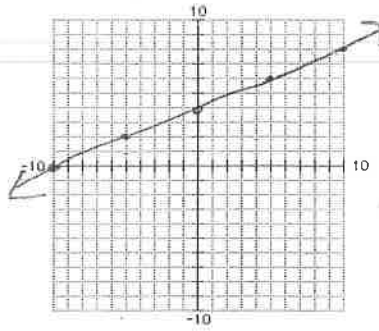
18. Graph each equation or inequality.

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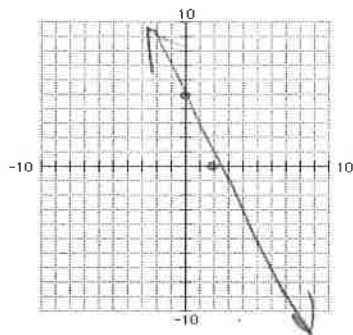
e.  $y = -x + 2$



b.  $y = \frac{2}{5}x + 4$



c.  $5x + 2y = 10$



d.  $3x - 2y = 12$

