Summer Resources
Middle School Math Department
Robinson Secondary School

Honors Algebra 1

This packet contains practice problems that can be used to help you prepare for your honors math course in the fall.

Top 5 Topics
The Honors Algebra 1 teachers have selected these topics as the “Top 5” to review before you begin Honors Algebra 1.

1. Simplifying expressions with positive and negative fractions
2. Order of operations
3. Using the distributive property
4. Solving multi-step equations
5. Geometric concepts: Pythagorean Theorem & angle relationships

Other Resources
If you prefer, you could also use one of these workbooks. No workbook is perfectly aligned to a math course, but these will provide a variety of problems to keep your math skills sharp!

Pre-Algebra Skills for Success (Carson Dellosa)
Skill Builders Pre-Algebra (Rainbow Bridge Publishing)
Spectrum Math Workbook, Grade 8 (Spectrum)
Part 1: Simplifying Expressions

Operations with Fractions:

*Best strategy for numbers you will encounter in Algebra:*
  - Convert all mixed numbers to improper fractions.
  - Find a common denominator.
  - Simplify. In Algebra, we leave our answers as improper fractions.

*Best strategy for numbers you will encounter in Algebra:*
  - Convert all mixed numbers to improper fractions.
  - If dividing, remember to **multiply by the reciprocal**.
  - Simplify a numerator and a denominator, if possible.
  - Multiply straight across. In Algebra, we leave our answers as improper fractions.

**Order of Operations: NO CALCULATOR!!**

**Additional online resource:** Intro to order of operations (video)

1) \((-4)^2 \div 2 + (4 - 7) \cdot 4\)  
2) \(2(3^3 + 8) \div (-5)\)  
3) \(\frac{-24 - 2 + 10}{(-5 - 3)^2}\)

4) \(|-14 + 6| - |8 - 19|\)  
5) \(4^3 \div \left[-14 + (-2 \cdot (-5))\right]\)  
6) \(\sqrt{100} - (-5 \cdot 4 + 12)\)
Evaluating Expressions: NO CALCULATOR!!

Additional online resource: Evaluating expressions with two variables (video)

7) 3(n -12) + 4n, when n = 5

8) 7b – 2a, when a = \(-\frac{3}{2}\) and b = 4

9) 3x^2 + 5x +1, when x = -2

10) \(-\frac{2r}{t}\) + 7, when r = 12 and t =3

11) \((3x)^2 - 7y^2\), when x = 3 and y = -2

12) 4(3d + 6) – 2d, when \(d = \frac{1}{6}\)

Distributive Property and Combining Like Terms:

Additional online resource: Distributive property with variables (video)

Additional online resource: Intro to combining like terms (video)

13) -3(4x + 9)

14) -2x + 8y – 3x + 12y – 16

15) 15x – (3x – 4) + 8

16) 4(2x – 7) + 3(-5x + 6)

17) 5 + 3x – 8 + 2y – 9x + 7

18) (7x – 2y)(-4)

19) \(\frac{2}{3}(3x-12)+4x-5\)

20) \(\frac{1}{3}x - \frac{3}{4}y + \frac{2}{3}x - \frac{5}{4}y\)
Part 2: Solving Equations and Inequalities

Solve each equation. SHOW ALL WORK!!

Additional online resource: Why we do the same thing to both sides: Variable on both sides (video)

Additional online resource: Two-step inequalities | Algebra (video)

21) $3x - 5 \leq 13$

22) $\frac{1}{4}d + 2 = 3$

23) $-21 - 5x > 64$

24) $5y + 7y = 3y - 18$

25) $18y - 21 = 15y + 3$

26) $2(x - 5) + 2 \geq 12$

27) $\frac{4}{7}(y - 14) = -5$

28) $\frac{2a + 3}{7} = \frac{3a}{6}$

Part 3: Properties

Additional online resource: Properties of Algebraic Equations

Additional online resource: What are the Algebraic Properties? (19 Terrific Examples!)

Understand the properties listed below.

The Properties of Real Numbers:

- Commutative Property
- Associative Property
- Identity Property
- Inverse Property
- Zero Property of Multiplication
- Distributive Property

The Properties of Equality:

- Reflexive Property
- Symmetric Property
- Transitive Property
- Substitution Property
- Addition Property
- Subtraction Property
- Multiplication Property
- Division Property
Part 4: Subsets of real numbers and number sense

Additional online resource: Perfect Squares

Additional online resource: Perfect Cubes Practice Flashcards

29) List all the perfect squares from 1 to 400, and perfect cubes up to 1000
### ANSWERS:

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<td>31</td>
<td>18</td>
<td>(-28x + 8y)</td>
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<td>9</td>
<td>3</td>
<td>19</td>
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<tr>
<td>10</td>
<td>–1</td>
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<td>(x - 2y)</td>
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<td>(x \leq 6)</td>
<td>22</td>
<td>(d = 4)</td>
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<tr>
<td>23</td>
<td>(x &lt; -17)</td>
<td>24</td>
<td>(y = -2)</td>
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<td>25</td>
<td>(y = 8)</td>
<td>26</td>
<td>(x \geq 10)</td>
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<td>27</td>
<td>(y = \frac{21}{4})</td>
<td>28</td>
<td>(a = 2)</td>
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