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) $(-4)^2 \div 2 + (4-7) \bullet 4$

2) $2\left(3^3 + 8\right) \div (-5)$

3) $\dfrac{-24-2+10}{(-5-3)^2}$

4) $\left|-14+6\right| - \left|8-19\right|$

5) $4^3 \div \left[-14 + \left(-2 \bullet (-5)\right)\right]$

6) $\sqrt{100} - (-5 \bullet 4 + 12)$

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) $3x-5\le 13$

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

23) $-21-5x>64$

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

25) 18y – 21 = 15y + 3

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

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:

1) -4	11) 53	21) $x \le 6$
2) -14	12) $\frac{77}{3}$	22) $d = 4$
3) $-\frac{1}{4}$	13) $-12x - 27$	23) $x < -17$
4) -3	14) $-5x + 20y - 16$	24) $y = -2$
5) -16	15) $12x + 12$	25) $y = 8$
6) 18	16) $-7x - 10$	26) $x \ge 10$
7) -1	17) $-6x + 2y + 4$	27) $y = \frac{21}{4}$
8) 31	18) $-28x + 8y$	28) $a = 2$
9) 3	19) $6x - 13$	29) $1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400$ $1, 8, 27, 64, 125, 216, 343, 512, 729, 1000$
10) -1	20) $x - 2y$	