**Summer Packet 2023- Algebra 1 College Prep**

**Students Entering Algebra 1**

**Purpose:** This packet is designed to help students stay on track over the summer and enter 8th grade Algebra 1 confident and prepared for a great school year. Math teachers have selected the 6 skills that are important for the students' success in 8th grade Algebra 1. If a student struggles with these concepts, I highly recommend that they watch the instructional videos provided. The instructional videos are available by scanning the QR code with a smart phone. After watching the video that is linked, students can choose to continue watching videos on Khan Academy for extra help or work problems live on the site and get immediate feedback to see if their solution is correct. Watching videos and online practice is not required but may prove beneficial for students that often struggle in math or lose skills over the summer. **SHOW ALL WORK TO RECEIVE CREDIT.**

## Concept 1: Integer Operations

Directions: Solve each problem showing all steps and circle your answer. Evaluate each expression. NO CALCULATOR ALLOWED.

1. $68 + 22 + 50 - 36$

2. $84 + 80 — 67 + 68$

3. $96 + (-1) - 45 - 98$

Find each product.

4. $6 \times 7 \times -2$

5. $-10 \times 5 \times -7$

Find each quotient.

6. $-105 \div 5$

7. $\frac{-14(2)}{7}$

8. $\frac{21}{-7}$

**Concept 2: Writing and Solving Multi-Step Equations**

Directions: Solve the equation or inequality. Isolate the variable. Show all steps and circle your answers. NO CALCULATOR ALLOWED.

1. $18 = -3(m - 6)$

2. $-8(8n + 2) = 112$

3. $-20 = -4x - 6$

4. $12 = -4(-6x - 3)$

5. $5(2x - 1) = 25$

6. $3(2 - 5x) + 4(6x) = 12$

7. $5y + 2(y - 6) = 4(y + 1) - 2$

8. $4(2n + 1) = 3(6n + 3) + 1$

Write each sentence as an algebraic equation and solve.

9. The product of a number and 9 is 34.

10. The difference of a number and 10 is equal to 30.

**Concept 3: Order of Operations**

Directions: Simplify each expression. NO CALCULATOR ALLOWED.

1. $6 \cdot 3^2 + 2 \cdot 8$

2. $68 - 5 \cdot 2^3$

3. $3(1 + 2 \cdot 5) + 4$

4. $8 + 3(2 \cdot 6 - 1)$

5. $\frac{4+|6-2|+8^2}{4+6 \cdot 4}$

6. $5[3(2 + 5) - 5]$

7. $\frac{-3-2(-9)}{-15-3(-4)}$

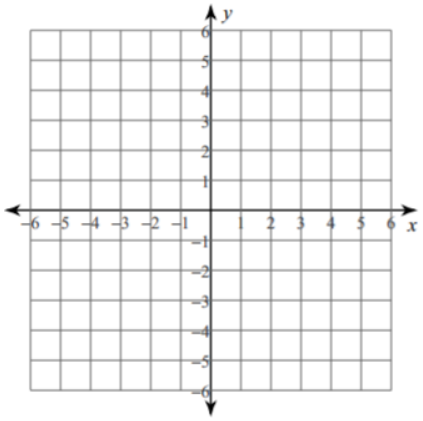
8. $5 + 2[(7 - 5)^2 + (1 - 3)]$

**Concept 4: Graphing Linear Equations**

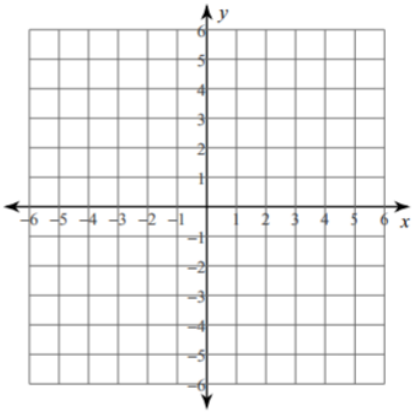
Directions: Sketch the graph of each line. Remember to use the y-intercept and the slope.

Slope-intercept form: $y = mx + b$

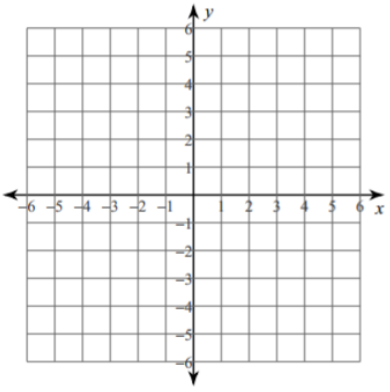
1. $y = \frac{7}{4}x - 2$ m= b=



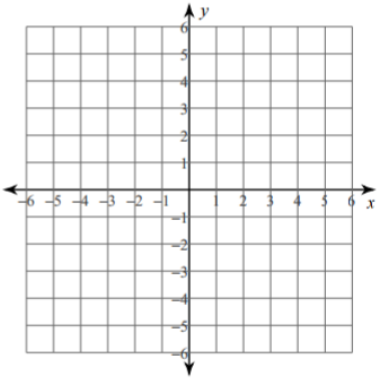
2. $y = -\frac{4}{3}x + 3$ m= b=



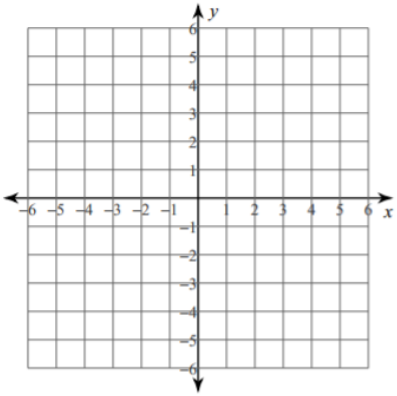
3. $y = -3$ m= b=



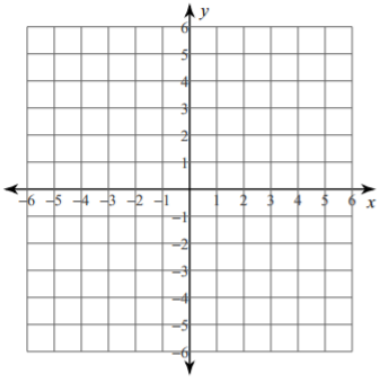
4. $y = 4x + 5$ m= b=



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



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



**Concept 5: Polynomials**

Directions: Simplify. NO CALCULATOR ALLOWED ON THIS SECTION.

1. $(2h^7)(6h)$

2. $\frac{k^{10}}{k^4}$

3. $18x^2 - 7x + 5x^2 + 3x$

4. $(3x + 2) + (5x - 7)$

5. $(x - 7) - (5x + 3)$

6. $(12a^7)(-4a^2b^6)$

7. $\frac{n^3 \cdot n^5}{n^2}$

8. $3(2 - 5y)$

*****For success in Algebra 1, all students need to know perfect squares from 1-17, 20, 25 and perfect cubes from 1-10. (ex: $3^2 = 9,\ 15^2 = 225,\ 20^2 = 400, 5^3 = 125, 9^3 = 729$). This is good to learn with flash cards if you do not already know them.**

**Concept 6: Factoring**

Directions: Factor out the greatest common factor (GCF). You can check by multiplying. NO CALCULATOR ALLOWED ON THIS SECTION.

$1. 3y^2 + 18y$

2. $10a^6 - 5a^8$

3. $9b^3 - 54b^2 + 9b$

4. $-35 + 14y - 7y^2$

5. $25z^3 - 20z^2$

6. $x^7 + x$

**Concept 7: Exponents**

Directions: Simplify using the rules of exponents. NO CALCULATOR ALLOWED ON THIS SECTION.

1. $\frac{p^7 q^{20}}{pq^{15}}$

2. $\frac{9a^4 b^7}{27ab^2}$

3. $x^0$

4. $4x^0$

5. $-7x^0$

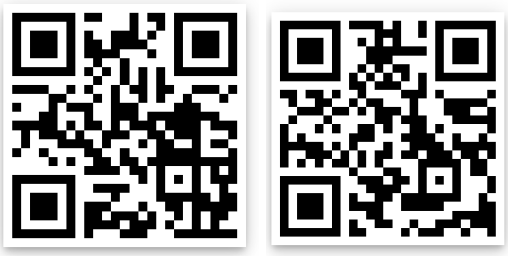
6. $7x^{-3}$

7. $(2x^{10}y^{-3})(9x^4y^{-7})$

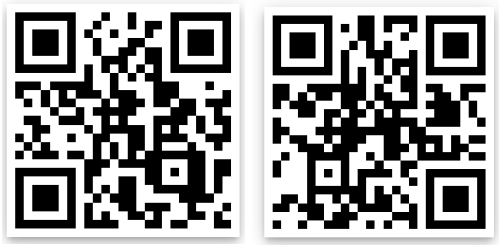
**QR CODES:**

**Each QR code links to a video lesson. Some are on YouTube, and others are on Khan Academy. Watching the videos is not mandatory, but they can be used to review the material on this review.**

1. Integer Operations



2. Writing and Solving Multi-Step Equations



3.Order of Operations

4. Graph Linear Equations in Slope-Intercept Form

5. Adding and Subtracting Polynomials

Multiplying Monomials

Dividing Monomials

6. Factoring GCF with Polynomials

7. Exponent Rules