# Algebra Review Station 1
## Functions and Simplifying Expressions

Directions: Simplify each expression without using a calculator. Leave all non-integer answers in terms of simplified, improper fractions and radical expressions when applicable.

<table>
<thead>
<tr>
<th>Expression</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. {(-4, 5), (-4, -5), (0, 2), (0, -2), (6, 1)}</td>
<td>2. (\frac{14x^2y^5z}{2x^9z^3y^5})</td>
<td>3. ((3x)^{-2})</td>
</tr>
<tr>
<td>State the domain.</td>
<td>(3x^{-2})</td>
<td>(x^{-3}y^3z^0)</td>
</tr>
<tr>
<td>State the range.</td>
<td></td>
<td>(8x^2z^4y^{-7})</td>
</tr>
<tr>
<td>Is the relation a function? Why or why not?</td>
<td>4.</td>
<td>5.</td>
</tr>
<tr>
<td>6. (4x^0)</td>
<td>7. ((4x)^0)</td>
<td>8. ((3x - 10)^2)</td>
</tr>
<tr>
<td>9. ((-5x + 1)^{-2})</td>
<td>10. Evaluate the function at the given value.</td>
<td></td>
</tr>
<tr>
<td>(f(-4) = \frac{2}{-x^2 + 4})</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Algebra Review Station 2
#### Solving Equations and Inequalities

Directions: Solve each equation or inequality. There may be more than one solution. Leave all non-integer answers in terms of simplified, improper fractions when applicable. No answers may be written in decimal form. If an equation/inequality has no solution, write “no solution.”

<table>
<thead>
<tr>
<th>Equation/Inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  (6x - 4 = \frac{3}{4}x - 25)</td>
</tr>
<tr>
<td>2.  (</td>
</tr>
<tr>
<td>3.  (</td>
</tr>
<tr>
<td>4.  (\sqrt{2x + 5} = 4)</td>
</tr>
<tr>
<td>5.  (-4x - 5 &gt; 2(-x + 10))</td>
</tr>
<tr>
<td>6.  (</td>
</tr>
</tbody>
</table>
### Algebra Review Station 3
#### Factoring & Solving

Directions: For #1-8 factor the expression as completely as possible. If the expression cannot be factored, write “prime.” For #9-10 solve each equation; find all solutions.

<table>
<thead>
<tr>
<th></th>
<th>Expression 1</th>
<th>Expression 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$12x^2y^3 + 8xy^5$</td>
<td>$n^2 + 7n + 12$</td>
</tr>
<tr>
<td>2.</td>
<td>$2x^4 + 4x^2 - 96$</td>
<td>$18x^2 - 8y^2$</td>
</tr>
<tr>
<td>3.</td>
<td>$3b^2 + 16b - 35$</td>
<td>$8x^2 - 26xy + 15y^2$</td>
</tr>
<tr>
<td>4.</td>
<td>$27x^3 - 8$</td>
<td>$x^3 + 2x^2 - 4x - 8$</td>
</tr>
<tr>
<td>5.</td>
<td>$8x^2 - 26xy + 15y^2$</td>
<td>$x^3 = -8x^2 - 15x$</td>
</tr>
</tbody>
</table>
Algebra Review Station 4
Solving Systems

Directions: For #1-3 Solve each system of equations. Leave all non-integer answers in terms of simplified, improper fractions when applicable. No answers may be written in decimal form. If the system has no solution, write “no solution.” For #4 graph the system of inequalities on graph paper, give an example of a solution set of the inequality.

1. 
   \[-2x + 3y = 8\]
   \[9x - 3y = -15\]

2. 
   \[3x + 4y = \frac{15}{2}\]
   \[9x - 4y = \frac{1}{2}\]

3. 
   \[4x - y = -19\]
   \[7x = -4y + 7\]

4. 
   \[2x - y \geq 2\]
   \[4x - 3y > 1\]
1.) In 2005, CB West sold 66 total pieces of clothing for a total of $3,415. The school store only had two types of clothing apparel: sweatshirts and jackets. Sweatshirts cost $40 and jackets cost $65. How many sweatshirts and jackets did West sell?

2. The sum of two numbers is 57. The larger of the two numbers is 3 less than 4 times the smaller. What are the two numbers?

3. You can work at most 20 hours next week. You need to earn at least $92 to cover you weekly expenses. Your dog-walking job pays $7.50 per hour and your job as a car wash attendant pays $6 per hour. Write a system of linear inequalities to model the situation.

4. Marsha is buying plants and soil for her garden. The soil cost $4 per bag, and the plants cost $10 each. She wants to buy at least 5 plants and can spend no more than $100. Write a system of linear inequalities to model the situation.
**Algebra Review Station 6**  
**Writing Lines & Basic Graphing**

**Directions:** Write the equation of the line described for each problem in slope-intercept form. Graph the line on graph paper. All answers must be written in simplified, improper fraction form. No decimals; no mixed numbers.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The line has a slope of $\frac{3}{4}$ and passes through the point $(5, -9)$.</td>
<td>$y = \frac{3}{4}x - 14$</td>
</tr>
<tr>
<td>2. The horizontal line has a $y$-intercept of 4.</td>
<td>$y = 4$</td>
</tr>
<tr>
<td>3. The vertical line has an $x$-intercept of -2.</td>
<td>$x = -2$</td>
</tr>
<tr>
<td>4. The line passes through the points $(-1, -3)$ and $(2, 1)$.</td>
<td>$y = 2x - 5$</td>
</tr>
<tr>
<td>5. The line is parallel to $3x - y = 7$ and passes through the point $(1, 2)$.</td>
<td>$y = \frac{7}{3}x - \frac{5}{3}$</td>
</tr>
<tr>
<td>6. The line is perpendicular to $y = -3x + 9$ and has an $x$-intercept of 4.</td>
<td>$y = \frac{1}{3}x + \frac{4}{3}$</td>
</tr>
</tbody>
</table>
## Algebra & Geometry Review Stations Answer Key

### Station 1
1) **Domain:** \{-4, 0, 6\}  
   **Range:** \{-5, -2, 1, 2, 5\}  
   Not a function, some inputs have more than one output.

2) \[
\begin{align*}
\frac{7}{x^2-2z^2} & , \\
\frac{1}{9x^2} & , \\
\frac{3}{x^2} & , \\
\frac{y^{10}}{8x^5z^4} & , \\
9x^2 - 60x + 100 & , \\
\frac{1}{25x^2 - 10x + 1} & , \\
f(-4) & = \frac{1}{6}
\end{align*}
\]

### Station 2
1) \[x = -4\]
2) \[x = 5, \quad x = -13\]
3) No Solution  
4) \[x = \frac{11}{2}\]
5) \[x < -\frac{25}{2}\]
6) \[-4 < x < -\frac{2}{3}\]

### Station 3
1) \[4xy^3(3x + 2y^2)\]
2) \[(n + 3)(n + 4)\]
3) \[(x^2+8)(x^2-6)\]
4) \[2(3x-2y)(3x+2y)\]
5) \[(3b - 5)(b + 7)\]
6) \[(4x - 3y)(2x - 5y)\]
7) \[(3x-2)(9x^2+6x+4)\]
8) \[(x+2)^2(x-2)\]
9) \[x = -\frac{4}{3}, \quad x = \frac{3}{2}\]
10) \[x = 0, \quad x = -3, \quad x = -5\]

### Station 4
1) \[x = -1, \quad y = 2\]
2) \[x = \frac{2}{3}, \quad y = \frac{11}{8}\]
3) \[x = -3, \quad y = 7\]
4) *See back of Answer Key for Graphs*

### Station 5
1) 35 sweatshirts and 31 jackets
2) 45 ad 12
3) \[x + y \leq 20\]
4) \[x + y \geq 5\]
5) \[7.50x + 6y \geq 92\]
6) \[4x + 10y \leq 100\]

### Station 6
1) \[y = \frac{3}{4}x - \frac{51}{4}\]
2) \[y = 4\]
3) \[x = -2\]
4) \[y = \frac{4}{3}x - \frac{5}{3}\]
5) \[y = 3x - 1\]
6) \[y = \frac{1}{3}x - \frac{4}{3}\]

*See back of answer key for graphs.*
Station 4

4) \( y = \frac{3}{4}x - \frac{51}{4} \)

Station 6

1) \( y = \frac{3}{4}x - \frac{51}{4} \)

2) \( y = 4 \)

3) \( x = -2 \)

4) \( y = \frac{4}{3}x - \frac{5}{3} \)

5) \( y = 3x - 1 \)

6) \( y = \frac{1}{3}x - \frac{4}{3} \)