Cherry Creek High School
Algebra 2/CP Algebra 2 Summer Assignment

Please have the following worksheets completed and ready to be handed in on the first day of class in the fall. Make sure that you show your work where it is appropriate. Answers are provided in the back, but you will not receive credit if you don’t show work on problems that require it. It is expected that you have a good understanding of this material coming into this course as teachers will not be doing an extensive review of material from previous math courses.

Have a great summer and we look forward to seeing you in the fall!

Cherry Creek High School
Department of Mathematics
Success in math is the goal!

The worksheets in this summer packet are intended to help Cherry Creek High School math students refresh the topics from Algebra 1 and Geometry that should be mastered before entering the Algebra 2 or CP Algebra 2 classroom this fall.

Each worksheet focuses on a different set of Algebra 1 or Geometry skills and is intended to be completed WITHOUT a calculator.

The more time that you spend keeping your math skills fresh this summer by doing the problems on each worksheet, the easier the transition back to school and the rigors of the Algebra 2/CP Algebra 2 classroom will be for you.

The Cherry Creek High School math department desires that each student achieve at the apex of his/her ability, and sometimes beyond. Therefore, dedicating yourself to not only the math contained in these pages, but to becoming knowledgeable of the sequential understanding of math content, will help you be successful this year.

If you work hard and at least try each of the problems on each of the worksheets, you will enter your math class this fall already having confidence in the skills that will be required of you this coming year.

We suggest that you don’t do this whole packet all at once. Do one or two worksheets each day for a couple of weeks. DON’T leave the packet for the last day of summer. You will rush through it and not absorb the concepts that we want you to have mastered on the first day of class.

Remember, no calculator! Thinking through problems such as these without a calculator is very good for improving and/or keeping sharp your mental math abilities.

Good luck, have fun, and we’ll see a more confident you in the math classroom this fall!

Sincerely,

The Cherry Creek High School Algebra 2/CP Algebra 2 team of teachers
Using **NO CALCULATOR**, please be sure to show all work, including calculations, when answering the following.

Evaluate each expression and leave your answer in simplest form.

1) \(3(2 + 4) - 2(7 - 1)\)  
2) \(26 - (17 - 8 \div 2)\)

3) \(12 - 4 \cdot 2 + (-3)^2\)  
4) \(7^2 - 6(9 - 4) \div 3\)

5) \(5^2 - 6(2 - (-1))^2\)  
6) \(-8 + 5(1 - (-1))^2 + 4 \cdot 6\)

7) \(14 + (13 - 6)^2 - 4 \cdot 6\)  
8) \(-3|2 \cdot 8 - 4 \cdot 5| + (16 - 7) \div 3\)

9) \(\frac{7 \cdot (9 - 3)^2}{12}\)  
10) \([15(10) - 12(10)] \div 10\)

11) \(4|5 - (-3 \cdot 6)| + 7\)  
12) \((8 - 4)(12 - 3) \cdot \frac{1}{2}[2 + 1(2)]\)
Algebra 2 readiness
Worksheet #2 – Fractions, baby, oh yeah!

Using NO CALCULATOR, please be sure to show all work, including calculations, when answering the following.

Evaluate each expression and leave your answer in simplest form.

1) \( \frac{4}{9} + \frac{1}{9} \)

2) \( \frac{7}{15} + \frac{4}{15} - \frac{2}{15} \)

3) \( \frac{4}{7} - \frac{2}{7} \)

4) \( \frac{3}{8} + \frac{13}{8} \)

5) \( \frac{1}{2} + \frac{3}{7} \)

6) \( \frac{8}{9} - \frac{3}{4} \)

7) \( \frac{1}{2} + \frac{3}{4} \)

8) \( \frac{3}{6} - \frac{1}{5} \)

9) \( 5 \left( \frac{2}{7} \right) \)

10) \( \frac{3}{5} \cdot \frac{2}{3} \)

11) \( \left( -\frac{3}{4} \right) \left( -\frac{1}{9} \right) \left( -\frac{6}{5} \right) \)

12) \( \frac{1}{2} \cdot \frac{2}{3} \)

13) \( \frac{8}{9} ÷ \frac{2}{3} \)

14) \( \frac{6}{7} ÷ \frac{4}{5} \)
Using **NO CALCULATOR**, please be sure to show all work, including calculations, when answering the following.

Simplify each expression and leave your answer in simplest form.

1) \(3x + 5x\)  
2) \((7x)(9x)\)  
3) \(4x^2(7x + 5)\)  

4) \((2x-5)(2x+5)\)  
5) \((x-3)(3x+7)\)  
6) \(-(3x-1)^2\)  

7) \(2y^3 + 2y^2 - y + 16 - (5y^3 + 3y - 3)\)  
8) \(-7x + 8(-2x + 5)\)  

9) \(4y(2 - y) + 3y^2\)  
10) \(5(x + y) - 4(3x - 2y + 1)\)  

11) \(\frac{30x^2 + 20x - 10}{-5}\)  
12) \(\frac{6x^4 + 27x^5 + 3x^4 + 3x^5}{3}\)  

Evaluate at the given value.

13) \(4x^2 + 6x - 5\) when \(x = -3\)  
14) \(6|4b - 5| - 3|2 - 2b|\) when \(b = 2\)
Using **NO CALCULATOR**, use the rules of exponents to simplify. Answers cannot have negative exponents.

1) \(x^2x^5\)  
2) \(x^0x^8\)  
3) \((x^2y^3)(x^5y^3)\)  
4) \(5y^{-4}\)

5) \((x^3)^7\)  
6) \((a^{-2})^3\)  
7) \(\frac{n^3}{n^5}\)  
8) \((2b)^3(b^{-4})\)

9) \((mn)^2 \cdot n^4\)  
10) \(a^5 \cdot 5a^{-2} \cdot 5^{-2}\)

Evaluate each expression

11) \(5^4 \cdot 5^{-1}\)  
12) \(4^3\)  
13) \((425^2)^0\)

14) \(\left(\frac{5}{2}\right)^{-2}\)  
15) \(\frac{3 \cdot 3^3}{3^4}\)  
16) \(((-2)^3)^2\)
Using **NO CALCULATOR**, please be sure to show all work, including calculations, when simplifying the following radical expressions and solving radical equations.

**Simplify the following.**

1) \( \sqrt{16x^2} \)  
2) \( 3\sqrt{-27y^6} \)  
3) \( \sqrt[3]{\frac{36}{49}} \)  
4) \( \frac{125}{64}^{\frac{1}{3}} \)

5) \( 2\sqrt{5} + 5\sqrt{5} - 3\sqrt{5} \)  
6) \( \sqrt{20} + \sqrt{45} \)  
7) \( \frac{\sqrt{27x^3}}{\sqrt[3]{3x}} \)  
8) \( \sqrt{12x} \cdot \sqrt{3x} \)

9) \( \sqrt{8}\sqrt{45} \)  
10) \( 3\sqrt{y^3z^2} \cdot 3\sqrt{y^6z} \)  
11) \( 5\sqrt{75} - 2\sqrt{12} \)

**Solve the following radical equations.**

14) \( \sqrt{x} = 3 \)  
15) \( \sqrt{2x - 5} = 5 \)  
16) \( -3\sqrt{x + 4} - 1 = -13 \)
Using **NO CALCULATOR**, please be sure to show all work when factoring the following.

Distribute to simplify the following.
1) \(2x(3x - 5)\)  
2) \((x + 5)(x - 7)\)  
3) \((2x + 1)(3x - 5)\)

Factor out the common monomial.
4) \(2x^2 - 6x\)  
5) \(3x^2y^2 + 6xy^2 - 9x^3y\)

Factor these difference of squares.
6) \(x^2 - 9\)  
7) \(x^2 - 25\)  
8) \(9x^2 - 49\)  
9) \(100x^2 - 64y^2\)

Please factor the following trinomials.
10) \(x^2 - x - 12\)  
11) \(x^2 + 5x + 6\)  
12) \(x^2 + 2x - 15\)

13) \(x^2 - 8x + 16\)  
14) \(x^2 + 19x - 20\)  
15) \(x^2 + 14x + 33\)

16) \(2x^2 - x - 1\)  
17) \(3x^2 - 5x - 8\)
Using **NO CALCULATOR**, please be sure to show all work, including calculations, when answering the following.

Solve the following equations for x.

1) \(6x = 54\)
2) \(\frac{1}{3}x = 12\)
3) \(2x + 3x = 35\)
4) \(-\frac{3}{5}x = 7\)

5) \(7x = 42 + x\)
6) \(2x + 3 = 6x - 9\)
7) \(x + 2x = 48 - 5x\)

8) \(3 - 2(x - 1) = 2 + 4x\)
9) \(8x - 4 + 3(x + 7) = 6x - 3(x - 3)\)

10) \(2(x + 2) = -5(x - 8)\)
11) \(3(x - 2) - 5 = 8 - 2(x - 4)\)

12) \(4 + \frac{1}{2}x = 13\)
13) \(\frac{2}{3} = \frac{x + 7}{3x}\)
14) \(\frac{x - 2}{x + 3} = \frac{4}{5}\)
Using NO CALCULATOR, please be sure to show all work, including calculations, when answering the following.

Write the solution to the following inequalities in interval notation and graph them, too.

1) \(3x - 5 \leq 7\)  
2) \(4x - 6 > 2\)  
3) \(4x + 7 - x \leq 31\)  
4) \(2(x - 3) + 8x < -1\)  
5) \(3x + 2 \leq -7\) or \(3x + 2 > 8\)  
6) \(-4x + 6 < 22\)  
7) \(-2(3x - 1) \geq -22\)  
8) \(-7 \leq 2x - 3\)
Using **NO CALCULATOR**, please be sure to show all work, including calculations, when answering the following.

Find the slope of the line between:
1) (9, 6) and (1, 4)  
2) (-3, -5) and (-2, -7)

Find the equation of the line using the given information.
3) \( m = -2 \) through (4, 5)  
4) through (-2, 6) and (-4, -2)

5) Parallel to #4, through (-8, 2)  
6) Perpendicular to #4, through (-4, 3)

Using the slope and y-intercept, sketch a graph of each line.
7) \( y = 2x - 1 \)  
8) \( y = -2/3x + 3 \)

Change the following to slope-intercept form, then sketch a graph.
9) \( 3x - 4y = 12 \)  
10) \( 3x + 6y = 12 \)
Using NO CALCULATOR, please be sure to show all work, including calculations, when answering the following. For circular objects, leave your answer in terms of $\pi$. Remember your units!

1) If two angles of a triangle are $32^0$ and $86^0$, find the third angle.

2) If a right triangle has a hypotenuse of 10 cm and one leg is 6 cm, find the length of the other leg.

3) If the base of a triangle is 10 in, and the height is 8 in, find the area.

4) Find the circumference of a circle with radius 5 feet.

5) Find the area of a circle with a diameter of 14 yards.

6) Find the volume of a right rectangular prism with height 8 cm, length 5 cm, and width 4 cm.

7) Find the volume of a right cylinder with height 8 cm and radius 4 cm.

8) The sides of a rectangle are in the ratio 3:2. If the perimeter of the rectangle is 55 cm, find the length and the width.

9) If 5 foot Sami casts a 12 foot shadow at 2:00 p.m., how long is the shadow of a 30 foot tree?

10) If it takes Alan 14 minutes to run 2 miles, how long will it take him to run 7 miles at the same pace?
# Algebra 2 Readiness Summer Packet Answers

## WS#1 – order of operations

<table>
<thead>
<tr>
<th>Problem</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>6</td>
<td>13</td>
<td>13</td>
<td>39</td>
<td>-29</td>
<td>36</td>
<td>39</td>
<td>-9</td>
<td>21</td>
<td>3</td>
<td>99</td>
<td>72</td>
</tr>
</tbody>
</table>

## WS#2 – fractions

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>5/9</td>
<td>3/5</td>
<td>1 4/7</td>
<td>2</td>
<td>13/14</td>
<td>5/36</td>
<td>4 1/4</td>
<td>17/30</td>
<td>10/7</td>
<td>2/5</td>
<td>-1/10</td>
<td>4 4/3</td>
<td>15/14</td>
<td></td>
</tr>
</tbody>
</table>

## WS#3 – simplifying expressions

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>8x</td>
<td>63x²</td>
<td>28x³ + 20x²</td>
<td>4x² - 25</td>
<td>3x² - 2x - 21</td>
<td>-9x² + 6x - 1</td>
<td>-3y³ + 2y² - 4y + 19</td>
</tr>
</tbody>
</table>

## WS#4 – exponents

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>x⁷</td>
<td>x⁸</td>
<td>y⁶/x³</td>
<td>5y⁴</td>
<td>x²⁴</td>
<td>1/a⁶</td>
<td>1/n⁷</td>
</tr>
</tbody>
</table>

## WS#5 – radicals

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>4x</td>
<td>-3y²</td>
<td>6/7</td>
<td>5/4</td>
<td>4√5</td>
<td>5√5</td>
<td>3x</td>
<td>6x</td>
</tr>
</tbody>
</table>

## WS#6 – distributing and factoring

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>6x²-10x</td>
<td>x²-2x-35</td>
<td>6x²-7x-5</td>
<td>2x(x-3)</td>
<td>3xy(xy+2y-3x²)</td>
<td>(x-3)(x+3)</td>
</tr>
</tbody>
</table>

## WS#7 – Solving linear equations

<table>
<thead>
<tr>
<th>Prob</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ans</td>
<td>x = 9</td>
<td>x = 36</td>
<td>x = 7</td>
<td>x = -35/3</td>
<td>x = 7</td>
<td>x = 3</td>
<td>x = 6</td>
</tr>
</tbody>
</table>

Hi there!
### WS#8 – Solving and graphing linear inequalities

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$x \leq 4$</td>
</tr>
<tr>
<td>2</td>
<td>$x &gt; 2$</td>
</tr>
<tr>
<td>3</td>
<td>$x \leq 8$</td>
</tr>
</tbody>
</table>

![Graphs of inequalities 1, 2, 3](image)

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>$x &lt; \frac{1}{2}$</td>
</tr>
<tr>
<td>5</td>
<td>$x \leq -3$ or $x &gt; 2$</td>
</tr>
<tr>
<td>6</td>
<td>$x &gt; -4$</td>
</tr>
</tbody>
</table>

![Graphs of inequalities 4, 5, 6](image)

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>$x \leq 4$</td>
</tr>
<tr>
<td>8</td>
<td>$x \geq -2$</td>
</tr>
</tbody>
</table>

![Graphs of inequalities 7, 8](image)

### WS#9 – equations and graphs of lines

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$\frac{1}{4}$</td>
</tr>
<tr>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>3</td>
<td>$y = -2x + 13$</td>
</tr>
<tr>
<td>4</td>
<td>$y = 4x + 14$</td>
</tr>
<tr>
<td>5</td>
<td>$y = 4x + 34$</td>
</tr>
<tr>
<td>6</td>
<td>$y = -\frac{1}{4}x + 2$</td>
</tr>
</tbody>
</table>

![Graphs of equations 1 to 6](image)

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>$y = 2x - 1$</td>
</tr>
<tr>
<td>8</td>
<td>$y = -\frac{2}{3}x + 3$</td>
</tr>
</tbody>
</table>

![Graphs of equations 7 and 8](image)

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>$y = \frac{3}{4} x - 3$</td>
</tr>
<tr>
<td>10</td>
<td>$y = -\frac{1}{2}x + 2$</td>
</tr>
</tbody>
</table>

![Graphs of equations 9 and 10](image)

### WS#10 – geometry

<table>
<thead>
<tr>
<th>Prob</th>
<th>Ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$62^\circ$</td>
</tr>
<tr>
<td>2</td>
<td>8cm</td>
</tr>
<tr>
<td>3</td>
<td>40 in$^2$</td>
</tr>
<tr>
<td>4</td>
<td>$10\pi$ ft</td>
</tr>
<tr>
<td>5</td>
<td>$49\pi$ yd$^2$</td>
</tr>
<tr>
<td>6</td>
<td>$160$ cm$^3$</td>
</tr>
<tr>
<td>7</td>
<td>$128\pi$ cm$^3$</td>
</tr>
<tr>
<td>8</td>
<td>11cm, 16.5cm</td>
</tr>
<tr>
<td>9</td>
<td>72 ft</td>
</tr>
<tr>
<td>10</td>
<td>49 min</td>
</tr>
</tbody>
</table>

![Images of geometry problems](image)