

## GHS: Algebra II CFA Semester 2 Student Sample Sheet

<p><b>1. Simplify, Rational Expr. (8-2,8-3) (ST. key 7)</b></p> <p>Simplify.</p> <p>1. <math>\frac{(4xy^3)^2(x^2y)^3}{8x^5y^4}</math>      2. <math>\frac{(x^2-6x+8)(x^2+5x+6)}{(3x-12)(x^2-4)}</math></p> <p>3. <math>\frac{5x}{x^2+x-6} - \frac{4}{x^2+4x+4}</math></p> <p>4. <math>\frac{4x^2-1}{x^2-4} \cdot \frac{x-2}{2x-1}</math></p> <p>5. <math>\frac{x^2}{x^2+2x+1} \div \frac{3x}{x^2-1}</math></p>	<p><b>2. Solving Rational Eq. &amp; Ineq. (8-5) (ST. key 1A15.0)</b></p> <p>Solve.</p> <p>1. <math>\frac{5x}{x-2} = \frac{3x+4}{x-2}</math>      2. <math>\frac{2x-5}{x-8} + \frac{x}{2} = \frac{11}{x-8}</math></p> <p>3. <math>\frac{6}{x-8} \leq 3</math>      4. <math>\frac{6}{x-2} \geq -4</math></p>	<p><b>3. Radical Expressions &amp; Rational Exponents (8-6) (ST. key 12, key 15)</b></p> <p>Write with an exponent.</p> <p>1a) <math>\sqrt[6]{x^4}</math>      1b) <math>\sqrt[5]{(3x)^4}</math></p> <p>Write as a radical and simplify (if possible).</p> <p>2a) <math>216^{\frac{2}{3}}</math>      2b) <math>(36x^3)^{\frac{3}{2}}</math></p> <p>Simplify.</p> <p>3a) <math>(25)^{\frac{1}{4}} \cdot (25)^{-\frac{7}{4}}</math>      3b) <math>(\sqrt[3]{-8x^9})^2</math></p>
<p><b>4. Solving Radical Equations &amp; Inequalities (8-8) (ST. key 12)</b></p> <p>Solve. Check your solution(s).</p> <p>1. <math>\sqrt[3]{4x+1} - 5 = 0</math></p> <p>2. <math>\sqrt{3x+6} = x+2</math></p> <p>3. <math>\sqrt{x-7} + 9 &lt; 12</math></p> <p>4. <math>\sqrt[3]{x+2} \geq 1</math></p>	<p><b>5. Composite Functions (9-4) (ST. 24, 25)</b></p> <p>Use: <math>f(x) = -\frac{1}{x}</math>, <math>g(x) = x^2 - 36x</math>,  <math>h(x) = 6 - x</math>, <math>k(x) = \sqrt{x}</math></p> <p>Find each function.</p> <p>1a) <math>(f \bullet g)(x)</math>    1b) <math>(g + h)(x)</math>    1c) <math>\left(\frac{g}{f}\right)(x)</math></p> <p>Find each value.</p> <p>2a) <math>f(g(-1))</math>    2b) <math>g(k(9))</math>    2c) <math>h(g(0))</math></p> <p>Write each composite function. State the domain of the composition.</p> <p>3a) <math>f(g(x))</math>      3b) <math>k(h(x))</math></p>	<p><b>6. Circles &amp; Ellipses (10-2, 10-3) (ST. 16)</b></p> <p>1. Write the equation of a circle with center (8, -3) and containing the point (-2, 21)</p> <p>2. <math>x^2 + y^2 + 4x = 6y - 5</math> is the equation of a circle. Write the equation in standard form. Then find the center and radius of the circle.</p> <p>3. Write an equation in standard form for an ellipse with center (0,0), co-vertex (-24, 0), and focus (0, -18).</p> <p>4. <math>16x^2 + 9y^2 = 144</math> is the equation of an ellipse. Write the equation in standard form. Then find the x- and y-intercepts, the foci, and the length of the major axis of the ellipse with the equation</p>

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<p><b>7. Hyperbolas &amp; Parabolas</b> (10-4, 10-5) (ST. 16)</p> <ol style="list-style-type: none"> <li>1. Write an equation in standard form of a hyperbola with center (5, 0), co-vertex (6, 0), and focus (5, <math>\sqrt{37}</math>)</li> <li>2. <math>144y^2 - 25x^2 = 3600</math> is the equation of a hyperbola. Write the equation in standard form. Then find the x- and y- intercepts, the foci and the asymptotes</li> <li>3. Write the equation in standard form of a parabola with vertex (0, 0) and directrix <math>y = 6</math>.</li> <li>4. <math>y^2 + 16 = 4x + 4y</math> is the equation of a parabola. Write the equation in standard form. Then find the vertex, the axis of symmetry, the focus and the directrix.</li> </ol>	<p><b>8. Classifying Conics</b> (10-6) (ST. 16)</p> <p>Use the equation of a conic section to determine if it is a circle, ellipse, parabola or hyperbola. Write the equation in standard form.</p> <ol style="list-style-type: none"> <li>1. <math>2x^2 + 2y^2 - 36x - 2y + 162 = 0</math></li> <li>2. <math>4y^2 + x - 12y + 12 = 0</math></li> <li>3. <math>x^2 - 9y^2 + 2x + 18y - 17 = 0</math></li> </ol>	<p><b>9. Combinations &amp; Permutations</b> (11-1) (ST. key 18)</p> <ol style="list-style-type: none"> <li>1. 15 people entered a talent contest. The top 3 contestants each win \$50. In how many different ways can 3 winners be chosen?</li> <li>2. How many different ways can 8 people be seated in a row of 5 chairs?</li> </ol>
<p><b>10. Probability</b> (11-2 to 11-4) (ST. key 18, key 19)</p> <ol style="list-style-type: none"> <li>1. Two spinners numbered 1-6 are spun. If all the numbers are equally likely, what is the probability that the result will be two even numbers?</li> <li>2. Cards numbered 1-25 are placed in a bag and one is drawn at random. Find the probability of:             <ol style="list-style-type: none"> <li>a) Drawing an odd number or a multiple of 7.</li> <li>b) Drawing an even number or a perfect square</li> </ol> </li> </ol>	<p><b>11. Binomial Theorem</b> (11-6) (ST. key 18, key 19, key 20)</p> <ol style="list-style-type: none"> <li>1. Expand <math>(2x + 3y)^3</math></li> <li>2. Find the THIRD term of <math>(3p + q)^3</math></li> <li>3. A survey showed that 1 in 3 people entering the post office are wearing glasses. At noon, 4 people enter the post office.             <ol style="list-style-type: none"> <li>a) What is the prob. that one of those 4 people is wearing glasses?</li> <li>b) What is the prob. that at least 2 of the 4 people are wearing glasses?</li> </ol> </li> </ol>	<p><b>12. Arithmetic Sequences &amp; Series</b> (12-3) (ST. 22)</p> <ol style="list-style-type: none"> <li>1. Find the 15<sup>th</sup> term (<math>a_{15}</math>) of the arithmetic sequence 1.00, 1.25, 1.50, 1.75, ...</li> <li>2. Find the missing terms in the arithmetic sequence: 85, <u>    </u>, <u>    </u>, -8, ...</li> <li>3. Find <math>S_{12}</math> for <math>101+95+89+83+\dots</math></li> </ol>
<p><b>13. Inf. Geo. Series &amp; Seq.</b> (12-4, 12-5) (ST. 22, key 23)</p> <ol style="list-style-type: none"> <li>1. Find the partial sums <math>S_1, S_2, S_3, S_{12}, S_{20}</math> and <math>S_n</math> of the infinite geometric series <math>1 + \frac{1}{2} + \frac{1}{4} + \dots</math></li> <li>2. Find the 10<sup>th</sup> term of a geometric sequence with <math>a_4 = -17</math> and <math>a_7 = 136</math></li> <li>3. Find <math>\sum_{k=1}^6 9\left(\frac{3}{4}\right)^{k-3}</math></li> </ol>	<p><b>14. Unit Circle</b> (prep. Trig.) (Chapter 13)</p> <p>label each angle with: degrees, radian measure, and coordinates</p> 	