**Algebra II**

This course is intended for students who will be taking Algebra II during the upcoming school year, or who have already taken Algebra II and are looking for review and reinforcement. **This course assumes an understanding of all Algebra I topics**. Please take the Algebra II placement test before registering. A score of 70% or higher is recommended to enroll in this course.

**Course Topics:** Equations and Inequalities, Relations and Functions, Systems of Equations and Inequalities, Quadratic Functions, Polynomials, Radical Functions, Exponential and Logarithmic Functions, Rational Functions, Conic Sections, Sequences & Series, Trigonometry, Statistics and Probability

**Algebra II Placement Test**

Complete the following questions without the use of a calculator.

1. Solve by using the quadratic formula: <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="2x^2-3x-6=0"><mn>2</mn><msup><mi>x</mi><mn>2</mn></msup><mo>−</mo><mn>3</mn><mi>x</mi><mo>−</mo><mn>6</mn><mo>=</mo><mn>0</mn></math>.
2. Solve by completing the square: <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="x^2-6x-16=0"><msup><mi>x</mi><mn>2</mn></msup><mo>−</mo><mn>6</mn><mi>x</mi><mo>−</mo><mn>16</mn><mo>=</mo><mn>0</mn></math>
3. Factor <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="3x^2+x-14"><mn>3</mn><msup><mi>x</mi><mn>2</mn></msup><mo>+</mo><mi>x</mi><mo>−</mo><mn>14</mn></math>.
4. Factor by grouping <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="xy-2a-2x+ay"><mi>x</mi><mi>y</mi><mo>−</mo><mn>2</mn><mi>a</mi><mo>−</mo><mn>2</mn><mi>x</mi><mo>+</mo><mi>a</mi><mi>y</mi></math>.
5. Find the equation of the line through (3, –6) that is parallel to <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="y=\frac{2}{3}x+3"><mi>y</mi><mo>=</mo><mfrac><mn>2</mn><mn>3</mn></mfrac><mi>x</mi><mo>+</mo><mn>3</mn></math>
6. Solve <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\sqrt{3m-5}-4=-3"><msqrt><mn>3</mn><mi>m</mi><mo>−</mo><mn>5</mn></msqrt><mo>−</mo><mn>4</mn><mo>=</mo><mo>−</mo><mn>3</mn></math>.
7. Melinda walked to the mall at 4 miles per hour and then rode back home in a bus at 24 miles per hour. If her total traveling time was 14 hours, how far was it to the mall?
8. Scott and Heather cut a 160-foot cord into two lengths. The ratio of the lengths was 7 to 1. How long was each length?
9. Simplify <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="(5+2\sqrt{3})(\sqrt{3}-3)"><mo stretchy="false">(</mo><mn>5</mn><mo>+</mo><mn>2</mn><msqrt><mn>3</mn></msqrt><mo stretchy="false">)</mo><mo stretchy="false">(</mo><msqrt><mn>3</mn></msqrt><mo>−</mo><mn>3</mn><mo stretchy="false">)</mo></math>.
10. Solve <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{5x}{2}-\frac{x-2}{3}=7"><mfrac><mrow><mn>5</mn><mi>x</mi></mrow><mn>2</mn></mfrac><mo>−</mo><mfrac><mrow><mi>x</mi><mo>−</mo><mn>2</mn></mrow><mn>3</mn></mfrac><mo>=</mo><mn>7</mn></math>.
11. Evaluate the expression <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\left(ab\right)^2"><msup><mrow data-mjx-texclass="INNER"><mo data-mjx-texclass="OPEN">(</mo><mi>a</mi><mi>b</mi><mo data-mjx-texclass="CLOSE">)</mo></mrow><mn>2</mn></msup></math> for a = 4 and b = 3
12. Simplify the expression <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{\left(x^7\right)^2}{x^7}"><mfrac><msup><mrow data-mjx-texclass="INNER"><mo data-mjx-texclass="OPEN">(</mo><msup><mi>x</mi><mn>7</mn></msup><mo data-mjx-texclass="CLOSE">)</mo></mrow><mn>2</mn></msup><msup><mi>x</mi><mn>7</mn></msup></mfrac></math>.
13. Solve the equation 3(y + 6) = 30.
14. Tell whether the lines are parallel, perpendicular, or neither:

7x – 4y = 4

x – 4y = 3

1. Simplify <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\sqrt{\frac{144}{49}}"><msqrt><mfrac><mn>144</mn><mn>49</mn></mfrac></msqrt></math>
2. Rationalize the denominator <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{4}{\sqrt{21}}"><mfrac><mn>4</mn><msqrt><mn>21</mn></msqrt></mfrac></math>
3. Simplify the product <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\left(3x-7\right)\left(3x-5\right)"><mrow data-mjx-texclass="INNER"><mo data-mjx-texclass="OPEN">(</mo><mn>3</mn><mi>x</mi><mo>−</mo><mn>7</mn><mo data-mjx-texclass="CLOSE">)</mo></mrow><mrow data-mjx-texclass="INNER"><mo data-mjx-texclass="OPEN">(</mo><mn>3</mn><mi>x</mi><mo>−</mo><mn>5</mn><mo data-mjx-texclass="CLOSE">)</mo></mrow></math>.
4. Find the difference <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="(-7x-5x^4+5)-(-7x^4-5-9x)"><mo stretchy="false">(</mo><mo>−</mo><mn>7</mn><mi>x</mi><mo>−</mo><mn>5</mn><msup><mi>x</mi><mn>4</mn></msup><mo>+</mo><mn>5</mn><mo stretchy="false">)</mo><mo>−</mo><mo stretchy="false">(</mo><mo>−</mo><mn>7</mn><msup><mi>x</mi><mn>4</mn></msup><mo>−</mo><mn>5</mn><mo>−</mo><mn>9</mn><mi>x</mi><mo stretchy="false">)</mo></math>
5. Write an equation in point-slope form for the line through the point (10,-9) with the given slope -2.
6. Find the slope of the line that passes through the pair of points (1, 7)

and (10, 1).

Answer Key

1. <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{3}{4}\pm\frac{\sqrt{85}}{2}"><mfrac><mn>3</mn><mn>4</mn></mfrac><mo>±</mo><mfrac><msqrt><mn>85</mn></msqrt><mn>2</mn></mfrac></math> 2.) 8, -2 3.) (3x+7)(x-2) 4.) (x+a)(y-2) 5.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="y=\frac{2}{3}x-8"><mi>y</mi><mo>=</mo><mfrac><mn>2</mn><mn>3</mn></mfrac><mi>x</mi><mo>−</mo><mn>8</mn></math>6.) 2 7.) 48 miles 8.) 140 ft, 20 ft 9.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="-9-\sqrt{3}"><mo>−</mo><mn>9</mn><mo>−</mo><msqrt><mn>3</mn></msqrt></math> 10.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{38}{13}"><mfrac><mn>38</mn><mn>13</mn></mfrac></math> 11.) 144 12.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="x^7"><msup><mi>x</mi><mn>7</mn></msup></math>13.) 4 14.) neither 15.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{12}{7}"><mfrac><mn>12</mn><mn>7</mn></mfrac></math> 16.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="\frac{4\sqrt{21}}{21}"><mfrac><mrow><mn>4</mn><msqrt><mn>21</mn></msqrt></mrow><mn>21</mn></mfrac></math> 17.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="9x^2-26x+35"><mn>9</mn><msup><mi>x</mi><mn>2</mn></msup><mo>−</mo><mn>26</mn><mi>x</mi><mo>+</mo><mn>35</mn></math> 18.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="2x^4+2x+10"><mn>2</mn><msup><mi>x</mi><mn>4</mn></msup><mo>+</mo><mn>2</mn><mi>x</mi><mo>+</mo><mn>10</mn></math> 19.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="y+9=-2(x-10)"><mi>y</mi><mo>+</mo><mn>9</mn><mo>=</mo><mo>−</mo><mn>2</mn><mo stretchy="false">(</mo><mi>x</mi><mo>−</mo><mn>10</mn><mo stretchy="false">)</mo></math> 20.) <math xmlns="http://www.w3.org/1998/Math/MathML" display="block" data-is-equatio="1" data-latex="-\frac{2}{3}"><mo>−</mo><mfrac><mn>2</mn><mn>3</mn></mfrac></math>

Scoring Guidelines

70% or higher (14 or more correct): Algebra II recommended

Under 70% (0-13 correct): Algebra I recommended