

**Helena Public Schools**  
**High School Mathematics**  
**Math I - Teacher Resource**

*Over-riding practices:*

- Graphical, Analytical and numerical relationships
- Word Problems / Problem Solving
- Comfort with “unfriendly” answers

Focal Points	
<b>Solving Equations Graphically, Algebraically and Numerically</b>	<ul style="list-style-type: none"> <li>• Arithmetic manipulations of expressions.               <ul style="list-style-type: none"> <li>◦ Combine like terms. Include problems like <math>5x^2 + 2x - (4x^2 - 8)</math></li> <li>◦ Distributive property.</li> </ul> </li> <li>• Exponents (simplifying expressions)               <ul style="list-style-type: none"> <li>◦ Laws of exponents</li> <li>◦ <math>a^n a^m = a^{n+m}</math></li> <li>◦ <math>\frac{a^n}{a^m} = a^{m-n}</math></li> <li>◦ <math>(a^n)^m = a^{nm}</math></li> </ul> </li> <li>• Literal equations               <ul style="list-style-type: none"> <li>◦ <math>ax + by = c</math>, for <math>y</math></li> </ul> </li> <li>• Single variable equations               <ul style="list-style-type: none"> <li>◦ <math>ax + by = c</math></li> <li>◦ <math>ax + b = cx + d</math></li> <li>◦ <math>a(bx + c) = d</math></li> <li>◦ <math>a(bx + c) = d(ex + f)</math></li> <li>◦ <math> ax + b  = c</math></li> <li>◦ <math>\sqrt{ax + b} = c</math></li> <li>◦ Inequalities like b and c above</li> </ul> </li> </ul>
<b>Linear Relationships</b>	<ul style="list-style-type: none"> <li>• Graphical, numerical, algebraic representations</li> <li>• Graph from:               <ul style="list-style-type: none"> <li>◦ <math>y = mx + b</math>, Include <math>m = 0</math> (horizontal line).</li> <li>◦ Standard form</li> <li>◦ Table of values</li> <li>◦ <math>x = c</math></li> </ul> </li> <li>• Direct variation, <math>y = kx</math></li> <li>• Write <math>y = mx + b</math> equations given:               <ul style="list-style-type: none"> <li>◦ Slope and y-intercept</li> <li>◦ Slope and a point on the line</li> <li>◦ Two points on the line</li> <li>◦ Graph</li> <li>◦ Intercepts</li> </ul> </li> <li>• Find x &amp; y intercepts</li> <li>• Curve fitting/modeling               <ul style="list-style-type: none"> <li>◦ Given data create scatter plot</li> <li>◦ Draw fitted line.</li> <li>◦ Write equation of fitted line.</li> </ul> </li> </ul>
<b>Linear Systems</b>	<ul style="list-style-type: none"> <li>• Solve using graphing and substitution               <ul style="list-style-type: none"> <li>◦ Two equations in <math>y = mx + b</math> form.</li> <li>◦ Two equations in standard form.</li> </ul> </li> </ul>
<b>Quadratics</b>	<ul style="list-style-type: none"> <li>• Factoring               <ul style="list-style-type: none"> <li>◦ <math>ax^2 + bx = x(ax + b)</math></li> <li>◦ <math>x^2 + bx + c, a = 1</math></li> </ul> </li> <li>• Multiplying polynomials               <ul style="list-style-type: none"> <li>◦ <math>ax(bx + c)</math></li> <li>◦ <math>(ax + b)(cx + d)</math></li> </ul> </li> <li>• Graphing               <ul style="list-style-type: none"> <li>◦ <math>y = ax^2 + bx</math></li> <li>◦ <math>y = x^2 + bx + c</math></li> <li>◦ Find vertex, line of symmetry, <math>x</math> and <math>y</math> intercepts</li> </ul> </li> <li>• Solve               <ul style="list-style-type: none"> <li>◦ <math>ax^2 + b = c</math></li> <li>◦ <math>(Ax + B)(Cx + D) = 0</math></li> <li>◦ <math>x^2 + bx + c = 0</math></li> </ul> </li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>• Transformational               <ul style="list-style-type: none"> <li>◦ translation</li> <li>◦ rotation</li> <li>◦ dilation</li> <li>◦ reflection</li> </ul> </li> <li>• Area and perimeter               <ul style="list-style-type: none"> <li>◦ Solve for an unknown dimension</li> </ul> </li> <li>• Volume and surface area of prism, spheres, cones, pyramids, cylinders.               <ul style="list-style-type: none"> <li>◦ Solve for an unknown dimension</li> </ul> </li> </ul>

**Maintenance Topics**

<b>Probability</b>	<ul style="list-style-type: none"> <li>• Definition of Probability</li> <li>• Finding Simple Probabilities</li> </ul>
<b>Statistics</b>	<ul style="list-style-type: none"> <li>• Mean, median and mode</li> <li>• Box and Whisker</li> <li>• Histograms</li> <li>• Stem and Leaf</li> </ul>
<b>Preview Topics</b>	<ul style="list-style-type: none"> <li>• Adding, Subtract, Multiply and Divide Fractions</li> <li>• Adding, Subtract, Multiply and Divide Integers</li> <li>• Simplify Expressions (add, subtract, distribute)</li> <li>• Coordinate Geometry</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Trigonometry Ratios</b></li> <li>• <b>Angle Relations</b> <ul style="list-style-type: none"> <li>◦ Complementary Angles</li> <li>◦ Supplementary Angles</li> <li>◦ Vertical Angles</li> </ul> </li> </ul>	