

**M3.D Algebraic Concepts**  
**M3.D.1 Demonstrate an understanding of patterns, relations and functions.**

<p><b>M3.D.1.1</b> Recognize, describe, or extend a variety of patterns.</p> <p><b>Reference:</b>  <b>2.8.3.A,</b>  <b>2.11.3.D</b></p>	<p><b>M3.D.1.1.1</b> Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).</p> <p><b>M3.D.1.1.2</b> Identify/describe the rule for a pattern shown (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).</p>
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**M3.D Algebraic Concepts**  
**M3.D.1 Demonstrate an understanding of patterns, relations and functions.**

<p><b>M3.D.1.2</b> Demonstrate simple function rules.</p> <p><b>Reference:</b>  <b>2.8.3.I</b></p>	<p><b>M3.D.1.2.1</b> Determine the missing element in a function table (functions may use +, - or x; allowable multiples are 2, 3 or 5; tables must have 3 INs and 3 OUTs listed).</p>
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**M3.D Algebraic Concepts**  
**M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<p><b>M3.D.2.1</b> Create/model expressions, equations and inequalities to match a problem situation.</p> <p><b>Reference:</b>  <b>2.8.3.D</b></p>	<p><b>M3.D.2.1.1</b> Create or match a story to a given combination of symbols (+, -, x, &lt;, &gt;, =) and numbers.</p> <p><b>M3.D.2.1.2</b> Choose the number sentence that matches a given story (one operation, + or - only).</p>
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**M3.D Algebraic Concepts**  
**M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<p><b>M3.D.2.2</b> Determine the missing number or symbol in a number sentence.</p> <p><b>Reference:</b>  <b>2.8.3.B, 2.8.3.F</b></p>	<p><b>M3.D.2.2.1</b> Find a missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, - or x through 9x5).</p> <p><b>M3.D.2.2.2</b> Identify the missing symbol (+, -, =, &lt;, &gt;) that makes a number sentence true.</p>
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**M5.D Algebraic Concepts**  
**M5.D.1 Demonstrate an understanding of patterns, relations and functions.**

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| <b>M5.D.1.1</b> Create or extend patterns.<br><b>Reference:</b><br><b>2.8.5.A</b> | <b>M5.D.1.1.1</b> Extend or find a missing element in a numerical or simple geometric pattern (pattern must show 3 repetitions).<br><b>M5.D.1.1.2</b> Create a numerical or geometric pattern showing 3 repetitions of that pattern. |
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V05 5-20

**M5.D Algebraic Concepts**  
**M5.D.1 Demonstrate an understanding of patterns, relations and functions.**

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| <b>M5.D.1.2</b> Analyze patterns.<br><b>Reference:</b><br><b>2.8.5.C</b> | <b>M5.D.1.2.1</b> Form a rule based on a given pattern, or illustrate a pattern based on a given rule (whole numbers up to 100 - patterns must show 3 repetitions). |
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V05 5-21

**M5.D Algebraic Concepts**  
**M5.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

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| <b>M5.D.2.1</b> Select and/or use appropriate strategies, including concrete materials, to solve number sentences.<br><b>Reference:</b><br><b>2.8.5.F, 2.8.5.G</b> | <b>M5.D.2.1.1</b> Solve for a missing number (blank, question mark, variable) in an equation involving a single operation.<br><b>M5.D.2.1.2</b> Choose the operation needed to solve for the variable in a one-step equation.<br><b>M5.D.2.1.3</b> Match a realistic situation to an equation, expression, inequality (<, >, =), table or graph (variable must be isolated, e.g., $17 + 39 = n$ ). |
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V05 5-22

**M5.D Algebraic Concepts**  
**M5.D.3 Analyze change in various contexts.**

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| <b>M5.D.3.1</b> Describe the relationship between rate of change and another variable (e.g., time, temperature).<br><b>Reference:</b><br><b>2.11.5.D</b> | <b>M5.D.3.1.1</b> Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables). |
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V05 5-23

**M8.D Algebraic Concepts**  
**M8.D.1 Demonstrate an understanding of patterns, relations and functions.**

<p><b>M8.D.1.1</b> Analyze, extend or develop descriptions of patterns or functions.   <i>Reference:</i>  <b>2.8.8.B, 2.8.8.G, 2.11.8.C</b></p>	<p><b>M8.D.1.1.1</b> Continue a numeric or algebraic pattern that could be extended infinitely (pattern must show 3 repetitions – may include up to 2 operations, squares and square roots).</p> <p><b>M8.D.1.1.2</b> Find missing elements in numeric, geometric or graphic patterns and/or functions (may be given a table or rule – pattern must show 3 repetitions).</p> <p><b>M8.D.1.1.3</b> Write/state the rule of a function (given elements in an input-output table, chart or list).</p>
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V05 8-20

**M8.D Algebraic Concepts**  
**M8.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<p><b>M8.D.2.1</b> Select and/or use a strategy to simplify an expression, solve an equation or inequality and/or check the solution for accuracy.   <i>Reference:</i>  <b>2.8.8.C, 2.8.8.E</b></p>	<p><b>M8.D.2.1.1</b> Solve one- or two-step equations and inequalities (should not include absolute values – one variable only).</p> <p><b>M8.D.2.1.2</b> Use substitution to check the accuracy of a given value for an equation or inequality (simple inequalities with one variable).</p> <p><b>M8.D.2.1.3</b> Determine the value of an algebraic expression by simplifying and/or substituting a value for the variable.</p>
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**M8.D Algebraic Concepts**  
**M8.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<p><b>M8.D.2.2</b> Create and/or interpret expressions, equations or inequalities that model problem situations.   <i>Reference:</i>  <b>2.8.8.C</b></p>	<p><b>M8.D.2.2.1</b> Match a written situation to its numeric and/or algebraic expression, equation or inequality (up to two variables in equations or expressions – one variable with inequalities).</p> <p><b>M8.D.2.2.2</b> Write and solve an equation for a given problem situation (one variable only).</p>
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**M8.D Algebraic Concepts**  
**M8.D.3 Analyze change in various contexts.**

Not assessed at Grade 8.

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**M8.D Algebraic Concepts**  
**M8.D.4 Describe or use models to represent quantitative relationships.**

<b>M8.D.4.1</b> Represent relationships with tables or graphs on the coordinate plane.  <i>Reference:</i> <b>2.8.8.C, 2.8.8.H</b>	<b>M8.D.4.1.1</b>	Graph a linear function based on an x/y table (integers only).
	<b>M8.D.4.1.2</b>	Match the graph of a linear function to its x/y table (integers only).
	<b>M8.D.4.1.3</b>	Match an inequality to its graph on a number line (integers only).
	<b>M8.D.4.1.4</b>	Match the linear equation ( $y = mx + b$ form) to the x/y table (integers only in the table).

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**M11.D Algebraic Concepts**  
**M11.D.1 Demonstrate an understanding of patterns, relations and functions.**

<b>M11.D.1.1</b> Analyze and/or use patterns or relations.  <i>Reference:</i> <b>2.8.11.Q, 2.8.11.A</b>	<b>M11.D.1.1.1</b>	Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
	<b>M11.D.1.1.2</b>	Determine if a relation is a function given a set of points or a graph.

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**M11.D Algebraic Concepts**  
**M11.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<b>M11.D.2.1</b> Solve and/or graph linear equations and inequalities using various methods.  <i>Reference:</i> <b>2.8.8.F, 2.8.11.D, 2.8.11.H, 2.8.11.J, 2.8.11.N</b>	<b>M11.D.2.1.1</b>	Solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).
	<b>M11.D.2.1.2</b>	Identify or graph linear inequalities on a coordinate plane.
	<b>M11.D.2.1.3</b>	Write and/or solve a linear equation from given problem situations.
	<b>M11.D.2.1.4</b>	Solve systems of equations using graphing, substitution and/or elimination (use numbers that assess concept rather than computation or number sense).
	<b>M11.D.2.1.5</b>	Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula). V05 11-20

**M11.D Algebraic Concepts**  
**M11.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

<b>M11.D.2.2</b> Simplify expressions involving polynomials.  <i>Reference:</i> <b>2.8.11.S</b>	<b>M11.D.2.2.1</b>	Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial X a trinomial).
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V05 11-21

## M11.D Algebraic Concepts

### M11.D.3 Analyze change in various contexts.

**M11.D.3.1** Describe and/or determine change.

**Reference:**  
2.8.8.J,  
2.11.8.B

**M11.D.3.1.1** Identify, describe and/or use constant or varying rates of change.

**M11.D.3.1.2** Determine how a change in one variable relates to a change in a second variable (e.g.,  $y=4/x$ , if  $x$  doubles, what happens to  $y$ ?).

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## M11.D Algebraic Concepts

### M11.D.3 Analyze change in various contexts.

**M11.D.3.2** Compute and/or use the slope of a line.

**Reference:**  
2.8.11.J,  
2.8.11.L

**M11.D.3.2.1** Apply the formula for the slope of a line to solve problems (formula given on reference sheet).

**M11.D.3.2.2** Given the graph of the line, 2 points on the line or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form.

**M11.D.3.2.3** Compute the slope of a linear equation or graph.

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## M11.D Algebraic Concepts

### M11.D.4 Describe or use models to represent quantitative relationships.

**M11.D.4.1** Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.

**Reference:**  
2.8.11.K,  
2.8.11.Q,  
2.11.11.A

**M11.D.4.1.1** Match the graph of a given function to its table or equation.

**M11.D.4.1.2** Graph linear functions in two variables.

**M11.D.4.1.3** Determine the maximum or minimum of a quadratic function.

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