

**The  
University of  
Chicago  
School  
Mathematics  
Project**

# Transition Mathematics

Correlated to  
Michigan  
Mathematics  
Grade Level  
Content Expectations

Grade 8



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**correlated to**  
**Michigan Mathematics Grade Level Content Expectations**  
**Grade 8**

Michigan Mathematics Grade Level Content Expectations	Wright Group/McGraw-Hill <i>Transition Mathematics</i> ©2008
<b>NUMBER AND OPERATIONS</b>	
<b>Understand real number concepts</b>	
<b>N.ME.08.01</b> Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube.	SE: 41, 180–186 TE: 40–41, 180–186 LM: 3-8A, 3-8B RM: 51 AR: 26–33
<b>N.ME.08.02</b> Understand meanings for zero and negative integer exponents.	SE: 12, 30–32, 38, 44, 502 TE: 31–32, 502–503 LM: 1-5A, 1-5B, 8-3A, 8-3B RM: 16 AR: 3–10
<b>N.ME.08.03</b> Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fraction forms of common repeating decimals, e.g., $0.1 = \frac{1}{10}$ ; $0.3 = \frac{3}{10}$ .	SE: 132–139, 153–160, 161–166, 265 TE: 132–139, 153–160, 161–166 LM: 3-1A, 3-1B, 3-4A, 3-4B, 3-5A, 3-5B RM: 36, 37, 41, 42, 43–45 AR: 26–33
<b>N.ME.08.04</b> Understand that irrational numbers are those that cannot be expressed as the quotient of two integers, and cannot be represented by terminating or repeating decimals; approximate the position of familiar irrational numbers, e.g., $\sqrt{2}$ , $\sqrt{3}$ , $\pi$ , on the number line and cube roots using calculators.	SE: 181–182, 184, 186, 193, 260–261, 263, 264, 265 TE: 181–182, 183, 261, 262 LM: 4-9A, 4-9B RM: 70–72
<b>N.FL.08.05</b> Estimate and solve problems with square roots	SE: 41–43, 75, 102, 180–186, 193 TE: 41–43, 180–186 LM: 1-7A, 1-7B, 3-8A, 3-8B RM: 18, 51 AR: 3–10, 26–33
<b>N.FL.08.06</b> Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, e.g., $\sqrt{130}$ is between 11 and 12.	SE: 41–43, 75, 102, 180–186, 193 TE: 41–43, 180–186 LM: 1-7A, 1-7B, 3-8A, 3-8B RM: 18, 51 AR: 3–10, 26–33
<b>Solve problems</b>	

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<b>N.MR.08.07</b> Understand percent increase and percent decrease in both sum and product form, e.g., 3% increase of a quantity $x$ is $x + .03x = 1.03x$ .	SE: 513–518 TE: 178, 513–518 LM: 3-7B, 8-5A, 8-5B RM: 113, 114 AR: 105–110
<b>N.MR.08.08</b> Solve problems involving percent increases and decreases.	SE: 513–518 TE: 178, 513–518 LM: 3-7B, 8-5A, 8-5B RM: 113, 114 AR: 105–110
<b>N.FL.08.09</b> Solve problems involving compounded interest or multiple discounts.	SE: 513–518 TE: 513–518 LM: 8-5A, 8-5B RM: 113, 114 AR: 105–110
<b>N.MR.08.10</b> Calculate weighted averages such as course grades, consumer price indices, and sports ratings.	SE: 40 TE: 40
<b>N.FL.08.11</b> Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.	SE: 17, 412, 493–499, 500–502, 562–566, 567–571 TE: 17–18, 493–499, 501, 562–566, 567–571 LM: 8-2A, 8-2B, 9-2A, 9-2B, 9-3A, 9-3B RM: 108, 123, 124, 125, 126 AR: 105–110, 116–121
<b>ALGEBRA</b>	
<b>Understand the concept of non-linear functions using basic examples</b>	
<b>A.RP.08.01</b> Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships ( $y = k/x$ ); cubics ( $y = ax^3$ ); roots ( $y = \sqrt{x}$ ); and exponentials ( $y = ax^a$ , $a > 0$ ); using tables, graphs, and equations.*	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 526–531, 532–536 TE: 526–531, 532–536 LM: 9-1A, 9-1B

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<b>A.PA.08.02</b> For basic functions, e.g., simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 425–431, 439–446 TE: 425–431, 439–446 LM: 7-5A, 7-7A, 7-7B RM: 114 AR: 88, 89, 92
<b>A.PA.08.03</b> Recognize basic functions in problem context, e.g., area of a circle is $\pi r^2$ , volume of a sphere is $\frac{4}{3}\pi r^3$ , and represent them using tables, graphs, and formulas.	SE: 463–469, 714–718 TE: 463–469, 714–718 LM: 2-4B, 7-6A, 7-6B, 11-8A, 11-8B RM: 105, 165 AR: 91–98, 147–154
<b>A.RP.08.04</b> Use the vertical line test to determine if a graph represents a function in one variable.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 425–429 TE: 425–429 RM: 109–110
<b>Understand and represent quadratic functions</b>	
<b>A.RP.08.05</b> Relate quadratic functions in factored form and vertex form to their graphs, and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 537–543, 729–735 TE: 537–543, 729–735 LM: 9-3A, 9-3B, 12-3A, 12-3B RM: 136–138 AR: 112, 115, 118, 124, 157, 159, 161, 165, 166
<b>A.RP.08.06</b> Graph factorable quadratic functions, finding where the graph intersects the x-axis and the coordinates of the vertex; use words “parabola” and “roots”; include functions in vertex form and those with leading coefficient –1, e.g., $y = x^2 - 36$ , $y = (x - 2)^2 - 9$ ; $y = -x^2$ ; $y = -(x - 3)^2$ .	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 537–543, 729–735 TE: 537–543, 729–735 LM: 9-3A, 9-3B, 12-3A, 12-3B RM: 136–138 AR: 112, 115, 118, 124, 157, 159, 161, 165, 166
<b>Recognize, represent, and apply common formulas</b>	
<b>A.FO.08.07</b> Recognize and apply the common formulas: $(a + b)^2 = a^2 + 2ab + b^2$ $(a - b)^2 = a^2 - 2ab + b^2$ $(a + b)(a - b) = a^2 - b^2$ ; represent geometrically.	SE: 687–689 TE: 687–689 LM: 11-6A RM: 172

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<b>A.FO.08.08</b> Factor simple quadratic expressions with integer coefficients, e.g., $x^2 + 6x + 9$ , $x^2 + 2x - 3$ , and $x^2 - 4$ ; solve simple quadratic equations, e.g., $x^2 = 16$ or $x^2 = 5$ (by taking square roots); $x^2 - x - 6 = 0$ , $x^2 - 2x = 15$ (by factoring); verify solutions by evaluation.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 736–741, 742–747 TE: 736–741, 742–747 LM: 12-4A, 12-4B, 12-5A, 12-5B RM: 187–188, 189–190 AR: 158, 159, 161, 165
<b>A.FO.08.09</b> Solve applied problems involving simple quadratic equations.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 558–564 TE: 558–564 LM: 9-6A, 9-6B RM: 142, 143 AR: 113, 114–115, 117–118, 120
<b>Understand solutions and solve equations, simultaneous equations, and linear inequalities</b>	
<b>A.FO.08.10</b> Understand that to solve the equation $f(x) = g(x)$ means to find all values of $x$ for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$ , but 1 is not a solution).	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 202–209 TE: 202–209 LM: 4-4A, 4-4B RM: 49–50 AR: 43, 44, 47
<b>A.FO.08.11</b> Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 202–209 TE: 202–209 LM: 4-4A, 4-4B RM: 49–50 AR: 43, 44, 47
<b>A.FO.08.12</b> Solve linear inequalities in one and two variables, and graph the solution sets.	SE: 538–544, 629–634, 635–640, 649–653 TE: 538–544, 629–634, 635–640, 649–653 LM: 8-9A, 8-9B, 10-3A, 10-3B, 10-4A, 10-4B, 10-6A, 10-6B RM: 120, 141–143, 144, 145 AR: 105–110, 132–139

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<b>A.FO.08.13</b> Set up and solve applied problems involving simultaneous linear equations and linear inequalities.	This skill is taught in Wright Group/McGraw-Hill <i>Algebra</i> . SE: 202–209, 210–215, 216–220 TE: 202–209, 210–213, 216–218 LM: 4-4A, 4-4B, 4-5A, 4-5B, 4-6A, 4-6B RM: 49–50, 51–52, 53 AR: 43, 44, 47
<b>GEOMETRY</b>	
<b>Understand and use the Pythagorean Theorem</b>	
<b>G.GS.08.01</b> Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.	SE: 96–102, 108, 114, 183, 413–418 TE: 96–102, 183, 413–418 LM: 2-5A, 2-5B, 6-9A, 6-9B RM: 29, 98 AR: 13–20, 71–80
<b>G.LO.08.02</b> Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.	SE: 413–418 TE: 413–418 LM: 6-9A, 6-9B RM: 98 AR: 71–80
<b>Solve problems about geometric figures</b>	
<b>G.SR.08.03</b> Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems.	SE: 463–469, 659, 663 TE: 463–469 LM: 7-6A, 7-6B RM: 105 AR: 91–98
<b>G.SR.08.04</b> Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles).	SE: 433–437, 450–455, 456–462 TE: 433–437, 450–455, 456–462 LM: 7-1A, 7-1B, 7-4A, 7-4B, 7-5A, 7-5B RM: 100, 103, 104 AR: 91–98
<b>G.SR.08.05</b> Solve applied problems involving areas of triangles, quadrilaterals, and circles.	SE: 92, 111, 437, 450–455, 456–462, 465–469, 660 TE: 111, 450–455, 456–462, 465–469 LM: 2-4A, 2-4B, 7-1A, 7-1B, 7-4A, 7-4B, 7-5A, 7-5B, 7-6A, 7-6B RM: 103, 104, 105 AR: 91–98
<b>Understand concepts of volume and surface area, and apply formulas</b>	

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<b>G.SR.08.06</b> Know the volume formulas for generalized cylinders (area of base) x height), generalized cones and pyramids ( $\square \square$ (area of base) x height), and spheres ( $\square \square \pi$ (radius) <sup>3</sup> ) and apply them to solve problems.	SE: 709–713, 714–718, 725–730 TE: 709–713, 714–718, 725–730 LM: 11-7A, 11-7B, 11-8A, 11-8B, 11-10A, 11-10B RM: 164, 165, 168, 169 AR: 147–154
<b>G.SR.08.07</b> Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders.	SE: 703–708, 714–718 TE: 703–708, 714–718 LM: 2-4B, 11-6A, 11-6B, 11-8A, 11-8B RM: 163, 165 AR: 147–154
<b>Visualize solids</b>	
<b>G.SR.08.08</b> Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.	SE: 686–690, 691–695 TE: 686–690, 691–695 LM: 11-3A, 11-3B, 11-4A, 11-4B RM: 158, 159, 160 AR: 147–154
<b>Understand and apply concepts of transformation and symmetry</b>	
<b>G.TR.08.09</b> Understand the definition of a dilation from a point in the plane, and relate it to the definition of similar polygons.	SE: 470–476, 719–724 TE: 470–476, 719–724 LM: 7-7A, 7-7B, 11-9A, 11-9B RM: 106, 166, 167 AR: 91–98, 147–154
<b>G.TR.08.10</b> Understand and use reflective and rotational symmetries of two-dimensional shapes and relate them to transformations to solve problems.	SE: 368–373, 374–379, 385, 503, 505 TE: 368–373, 374–379 LM: 6-2A, 6-2B, 6-3A, 6-3B, 8-3A, 8-3B RM: 89, 90, 91, 110 AR: 71–80
<b>DATA AND PROBABILITY</b>	
<b>Draw, explain, and justify conclusions based on data</b>	
<b>D.AN.08.01</b> Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.	SE: 748–749, 752–757, 761, 763–771 TE: 749, 752–757, 763–771 LM: 12-3A, 12-3B, 12-5A, 12-5B RM: 173, 175–177 AR: 161–168

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<b>D.AN.08.02</b> Recognize practices of collecting and displaying data that may bias the presentation or analysis.	SE: 740–744, 750, 761 TE: 740–744 LM: 12-1A, 12-1B RM: 170–171 AR: 161–168
<b>Understand probability concepts for simple and compound events</b>	
<b>D.PR.08.03</b> Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency.	SE: 187–193 TE: 187–193 LM: 3-9A, 3-9B RM: 52–54 AR: 26–33
<b>D.PR.08.04</b> Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams.	SE: 641–646 TE: 641–646 LM: 10-5A, 10-5B RM: 146 AR: 132–139
<b>D.PR.08.05</b> Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.	SE: 187–193 TE: 187–193 LM: 3-9A, 3-9B RM: 52–54 AR: 26–33
<b>D.PR.08.06</b> Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth roll as she was on any previous roll.	SE: 507–512 TE: 507–512 LM: 8-4A, 8-4B RM: 111, 112 AR: 105–110

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