A Correlation of

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Integrated CME Project
Mathematics I
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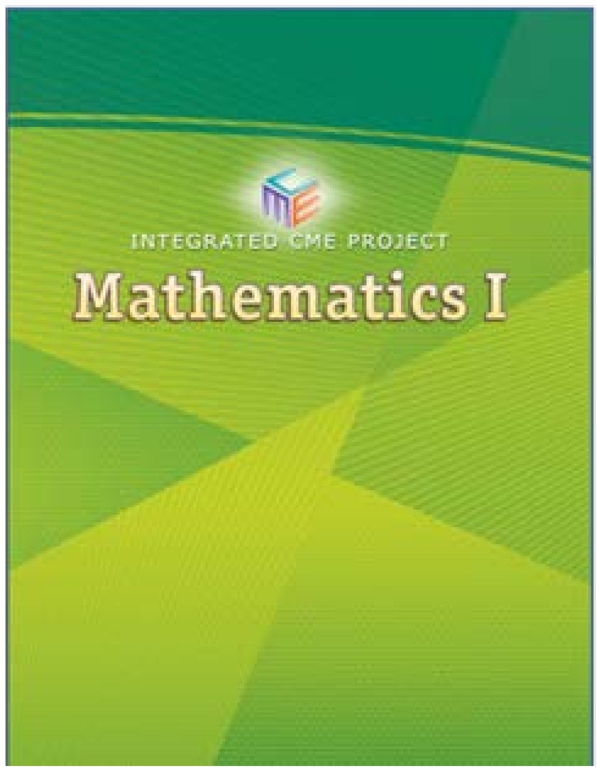

to the

Common Core State Standards for Mathematics - High School PARRC Model Content Frameworks Mathematics I

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to the Common Core State Standards for Mathematics
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Introduction

This document demonstrates how ***Pearson Integrated CME Project,*** **Mathematics I ©2013** meets the standards of the *Common Core State Standards for Mathematics, PAARC Model Content Frameworks, Mathematics I.* Correlation references are to the pages of the Student and Teacher's Editions.

The ***Integrated CME Project*** is an NSF-funded core mathematics program that was built for the Integrated Pathway of the Common Core State Standards. It includes content from algebra, geometry, as well as Precalculus concepts. The program's proven-effective pedagogy provides the focus, coherence, and rigor necessary to ensure today's students master the challenging new Common Core State Standards. The program also incorporates technology and hands-on projects and activities to engage today's digital students in deep mathematical learning.

Integrated CME Content includes Mathematics I, Mathematics II, and Mathematics III. Each course is focused on big ideas. ***Integrated CME Project*** is organized by coherent chapters. Chapters are comprised of investigation. Each Investigation is then composed of 3-6 lessons. The basic mathematics of each Investigation is accessible to all, and each Investigation can ultimately challenge the best students. The students work from a more informal to formal understanding of the mathematical topic explored in that particular chapter. The Investigation wrap-up, called Mathematical Reflections, provides an opportunity to review and summarize at the end of the chapter—good preparation for the Next-Generation assessments that will require students to justify their conclusions and mathematical understandings in writing. A Chapter Project extends student understanding by presenting challenges and highlighting connections to additional topics—projects are great preparation for performance tasks that will be on the upcoming Next-Generation assessments.

This document demonstrates the high degree of success students will achieve by using ***Pearson Integrated CME Project,*** **Mathematics I.**

Common Core State Standards for Mathematics - High School PARRC Model Content Frameworks Mathematics I	Integrated CME Project, ©2013 Mathematics I
Number and Quantity	
Quantities★ N -Q	
Reason quantitatively and use units to solve problems.	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	**SE/TE:** 174 (#3),175, 210, 211 (#2), 231 (#1), 232 (#10-11), 257 (#1), 253-256, 257 (#1), 258-260, 261 (#16), 292-293, 343 (#1-2), 368 (#1), 369, 370 (#6-10), 488-489, 491 (#1, 3-4), 492 (#6-8), 494 (#12), 524 (#6), 525 (#8-9), 540 (#5-6), 541 (#11), 542 (#12), 549 (#10-12)
2. Define appropriate quantities for the purpose of descriptive modeling.	**SE/TE:** 253-256, 257 (#1), 258-261, 368 (#1), 369, 370 (#6-10), 536-538, 539-542, 543-545, 549 (#10-12)
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**SE/TE:** 488-490, 491-494, 495-499, 500-502, 503-506, 507-510, 511-514, 515-518, 519 (#12, 14-15), 523-524, 525 (#7-10), 528-531, 532-534, 535 (#10), 536-538, 539-541, 542 (#12), 543-545, 546-548, 549 (#9-10), 575, 576 (#11-13)
Algebra	
Seeing Structure in Expressions A-SSE	
Interpret the structure of expressions	
1. Interpret expressions that represent a quantity in terms of its context.★	**SE/TE:** 93-97, 98-99, 100, 101 (#7), 102 (#11), 112, 113 (#8), 114 (#10), 279-281, 282 (#7-8, 10), 283 (#11, 13, 15)
a. Interpret parts of an expression, such as terms, factors, and coefficients.	For related content, please see: **SE/TE:** 104
b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	**SE/TE:** 103-105, 108 (#9-10), 113 (#5-7), 279-283
Write expressions in equivalent forms to solve problems	
3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★	**SE/TE:** 113 (#5-7), 411 (#4), 412 (#10, 12-13), 458-459, 460-461

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c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	**SE/TE:** 456-461, 464
Creating Equations★ A -CED	
Create equations that describe numbers or relationships	
1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	**SE/TE:** 136 (#9), 141 (#10), 159 (#1), 162-166, 167-171, 321 (#1-2), 322 (#8), 329, 331, 336 (#15), 366-370, 371 (#11, 13), 450 (#1-2), 451 (#3), 452 (#5, 8), 453 (#9), 454 (#11), 456 (#7), 525 (#10)
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**SE/TE:** 172-177, 178, 195-199, 200-207, 222 (#4-5), 240 (#16), 241 (#3-4)
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	**SE/TE:** 148-152, 172-177, 200-202, 203, 204 (#5-6), 265 (#11), 289-291, 292 (#1-2), 293 (#4-10), 304 (#1, 3), 305 (#4, 5), 306 (#9-10), 307 (#13), 311 (#10-12), 321, 322 (#8), 323 (#10-12), 329-332, 333 (#4-6), 334 (#10-11), 335
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	**SE/TE:** 132 (#1), 172-177, 288 (#40-49)
Reasoning with Equations and Inequalities A -REI	
Solve equations and inequalities in one variable	
3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**SE/TE:** 117-119, 120-125, 126-131, 132-133, 135-137, 138-142, 143-147, 148-152, 153-156, 157, 167-171, 321, 322 (#6, 9), 323 (#11), 329-336

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Solve systems of equations	
5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	For related content, please see: **SE/TE:** 300-305, 307 (#11, 13), 313-318, 319
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**SE/TE:** 216 (#1-3), 217 (#7), 297, 299 (#9), 300-305, 307 (#11, 13), 311 (#12), 312 (#13), 313-318, 319
Represent and solve equations and inequalities graphically	
10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	**SE/TE:** 187-188, 195-199, 200-207, 215-218, 222 (#5), 234-240, 241 (#3, 4), 392 (#8), 393 (#12), 395 (#17-18), 462-465, 466 (#9-10)
11. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	**SE/TE:** 216 (#1), 217 (#6), 218 (#11), 219 (#3), 279 (#16), 300, 304 (#2), 305 (#5), 319 (#3), 321, 323 (#10, 13), 324-325, 328 (#9), 331-332, 333 (#3, 5-6), 334 (#10), 343 (#7), 393 (#12)
12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**SE/TE:** 337-341, 342 (#1-3), 344 (#8, 12), 345-350, 351-354
Functions	
Interpreting Functions F-IF	
Understand the concept of a function and use function notation	
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	**SE/TE:** 363-365, 372-377, 378-382, 383-384, 385 (#2, 4), 386 (#7), 388

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2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**SE/TE:** 378-382, 383-386, 387-395, 427, 429 (#11), 431-439, 440-445, 452 (#5, 8), 454 (#11), 455 (#12-13), 466 (#7), 467 (#1)
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.	**SE/TE:** 429 (#12), 430 (#14-17), 431-434, 435 (#3), 436 (#4), 438 (#8, 11), 439 (#12-13), 447-454
Interpret functions that arise in applications in terms of the context	
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	**SE/TE:** 231 (#6), 285 (#4-7), 383-386, 387-395, 428 (#10), 429-430, 440-446, 462-466, 628 (#11-14)
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★	**SE/TE:** 428 (#10), 437 (#7), 438 (#10), 452 (#8), 454 (#11), 466 (#7)
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★	**SE/TE:** 253-261, 529-531, 535 (#11)
Analyze functions using different representations	
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	**SE/TE:** 225-230, 231-233, 234-238, 239-240, 283 (#16-17), 286 (#2-3), 288 (#28-39), 324-328, 387-395, 429 (#1), 462-466
a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	For related content, please see: **SE/TE:** 215, 217 (#6), 219 (#2-4), 222 (#5), 225-227, 231 (#2), 232 (#11, 13), 241 (#3-4), 283 (#16-17), 284-285, 286 (#2-3), 288 (#28-39), 388-389, 391-392, 393 (#9), 395 (#17-18)

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9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	**SE/TE:** 385 (#4), 389, 390 (#1), 391 (#2-3), 392 (#6-7), 393 (#12), 394 (#13-15), 443 (#2), 445 (#8, 10-11), 446 (#14-15)
Building Functions F-BF	
Build a function that models a relationship between two quantities	
1. Write a function that describes a relationship between two quantities.★	**SE/TE:** 383-384, 385 (#4-5), 431-434, 435 (#2-3), 436, 437 (#7), 438-439, 440-441, 442-446, Chapter 5 Project: 468-469
a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	**SE/TE:** 366-371, 372-377, 383-384, 385 (#4-5), 402-407, 408-412, 433, 435 (#2-3), 436, 437 (#7), 438-439, 440-446
2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	**SE/TE:** 432-435, 436, 438 (#11), 439, 440-442, 443-446, 453 (#9), 454 (#10)
Linear, Quadratic, and Exponential Models★ F -LE	
Construct and compare linear, quadratic, and exponential models and solve problems	
1. Distinguish between situations that can be modeled with linear functions and with exponential functions.	**SE/TE:** 428 (#10), 429 (#12), 437 (#7), 438 (#10-11), 443-444, 445 (#10-11), 452 (#8), 460 (#3-4, 6-7), 461 (#8, 11-12), 462-464, 466 (#7)
a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	**SE/TE:** 427-428, 429 (#11-12), 431-434, 435-439, 445, 447-449, 450 (#1-2), 451-453
b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	**SE/TE:** 428 (#10), 429 (#12), 437 (#7), 445 (#11), 447-449, 451 (#4), 452 (#8)
c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	**SE/TE:** 447-454, 456-458, 459 (#1), 460 (#3-4, 6-7), 461 (#8, 11-12), 462-464, 466 (#7)

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2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	**SE/TE:** 279-281, 282 (#8, 10), 283 (#11, 13, 15, 18), 286 (#1), 287 (#8-27), 288 (#50), 292 (#1-2), 294 (#2), 459 (#1), 460 (#4), 466 (#7)
3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	For related content, please see: **SE/TE:** 462-463, 464 (#3-4), 465 (#1-4), 466 (#7)
Interpret expressions for functions in terms of the situation they model	
5. Interpret the parameters in a linear or exponential function in terms of a context.	**SE/TE:** 289-293, 300, 304 (#1, 3), 305 (#5), 306 (#9-10), 428 (#10), 429 (#12), 437 (#7), 438 (#10-11), 445 (#10-11), 452 (#8), 456-459, 460 (#3-4, 6-7), 461 (#8, 11-12), 462-464, 466 (#7)
Geometry	
Congruence G-CO	
Experiment with transformations in the plane	
1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	**SE/TE:** 35, 36 (#5-6, 8-9), 279-280, 587-588, 589-591, 607-608, 608 (#1), 609 (#7), 607, 659 (#2), 660 (#6-7), 664 (#6-7), 669 (#1-3), 669 (Theorem 8.4), 674 (Theorem 8.5)
2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	**Mathematics I** For related content, please see: **SE/TE:** 189-194, 621-623, 624-630, 631-638, 639-647, 659, 660 (#6-7)
3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	For related content, please see: **SE/TE:** 639-647
4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	For related content, please see: **SE/TE:** 621-623, 624-627, 631-638, 639 (#9-12), 640-643, 644-646

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5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	For related content, please see: **SE/TE:** 621-623, 624-627, 631-638, 639-646, 661 (#11)
Understand congruence in terms of rigid motions	
6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	**SE/TE:** 648-652, 653-655
7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	**SE/TE:** 616 (#1-4), 617 (#8-12), 648-652, 653-655
8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	For related content, please see: **SE/TE:** 616 (#1-4), 617 (#5-12), 648-652, 653-655
Prove geometric theorems	
9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	Please see: Integrated CME Project Mathematics II **SE/TE:** 455-461, 462-468, 469-470, 472 (#1-2), 475 (#14), 499-504
10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*	For related content, please see: **SE/TE:** 576 (Conjecture 7.1), 576 (#10-13), 614-616

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11. Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*	For related content, please see: **SE/TE:** 618 (#17), 623 (#7), 666 (#6), 683 (#13)
Statistics and Probability	
Interpreting Categorical and Quantitative Data S-ID	
Summarize, represent, and interpret data on a single count or measurement variable	
1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	**SE/TE:** 488-489, 491 (#1, 3-4), 492 (#6-8), 493 (#10), 494 (#12), 495-499, 500 (#4), 501 (#9), 495-499, 520 (#1, 3)
2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	**SE/TE:** 481-487, 489 (#4), 490 (#6), 491 (#2, 4), 492 (#7), 493 (#11), 494 (#13-14), 495-498, 499 (#1), 500 (#2-7), 501 (#9)
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	**SE/TE:** 488 (#2), 493 (#11), 495-499, 500-501, 536
Summarize, represent, and interpret data on two categorical and quantitative variables	
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies).	**SE/TE:** 503-506, 506 (#1), 507-510
Recognize possible associations and trends in the data.	
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	**SE/TE:** 511-514, 515-519, 528-531, 533 (#4)
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	**SE/TE:** 523-524, 525-527, 529-530, 532 (#3), 534 (#8),

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c. Fit a linear function for a scatter plot that suggests a linear association.	**SE/TE:** 528-531, 532-535, 536-537, 539-542, 543-545, 546-549, 550
Interpret linear models	
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	**SE/TE:** 253-257, 257 (#1), 258-261, 289-291, 292-293, 529-531, 532 (#3), 534 (#7-8), 535 (#11). 537 (#1), 539 (#3-4)
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	**SE/TE:** 511-514, 515 (#3, 5), 516 (#6), 519 (#12-13)
9. Distinguish between correlation and causation.	**SE/TE:** 514, 516 (#6)

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