IXL Skill Plan for the TASC™

Mathematics

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Algebra

Creating Equations

Standard	IXL skills
9-12.HSA-CED.A.1: Create equations and inequalities in one variable and use them to solve problems.	**Linear equations** 1. Write variable equations YVW 2. Write and solve equations that represent diagrams GBC **Inequalities** 3. Write inequalities from graphs SEK 4. Write compound inequalities from graphs 6UV **Word problems** 5. Consecutive integer problems HDF 6. Weighted averages: word problems 2TQ
9-12.HSA-CED.A.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**Direct variation** 1. Write direct variation equations Y6M **Slope-intercept form** 2. Slope-intercept form: graph an equation UWB 3. Slope-intercept form: write an equation from a graph 9GW 4. Slope-intercept form: write an equation A42 5. Slope-intercept form: write an equation from a table SSE 6. Slope-intercept form: write an equation from a word problem HWM 7. Write linear functions: word problems 9RQ **Standard form** 8. Write equations in standard form ESP 9. Standard form: graph an equation U6U **Point-slope form** 10. Point-slope form: graph an equation F8H 11. Point-slope form: write an equation PPE

Quadratic equations

12. Graph quadratic functions in vertex form C7T

13. Graph quadratic functions in standard form HMW

14. Write a quadratic function from its vertex and another point YGV

Linear, quadratic, and exponential equations

15. Write linear, quadratic, and exponential functions AFA

9-12.HSA-CED.A.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.

1. Linear inequalities: word problems ZAY

2. Solve a system of equations using any method: word problems GDQ

9-12.HSA-CED.A.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

1. Rearrange multi-variable equations WSJ

Arithmetic with Polynomials and Rational Expressions

Standard	IXL skills

9-12.HSA-APR.A.1: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Model polynomials

1. Model polynomials with algebra tiles TYV

Addition and subtraction

2. Add and subtract polynomials using algebra tiles J7V

3. Add and subtract polynomials 5EK

4. Add polynomials to find perimeter 8AS

Multiplication

5. Multiply a polynomial by a monomial G2G

6. Multiply two polynomials using algebra tiles WR5

7. Multiply two binomials M7Q

8. Multiply two binomials: special cases 9JN

9. Multiply polynomials 58A

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9-12.HSA-APR.B.3: Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

Quadratics

1. Solve a quadratic equation using the zero product property   TRU
2. Match quadratic functions and graphs   QCE

Polynomials

3. Find the roots of factored polynomials   PVM
4. Match polynomials and graphs   XJU

Reasoning with Equations and Inequalities

Standard	IXL skills
9-12.HSA-REI.A.1: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	1. Properties of equality H8Q 2. Identify equivalent equations XNQ
9-12.HSA-REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	1. Solve radical equations EHE 2. Solve rational equations CHP
9-12.HSA-REI.B.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**Equations with models** 1. Model and solve equations using algebra tiles GRH **Linear equations** 2. Solve one-step linear equations TXJ 3. Solve two-step linear equations QAK 4. Solve advanced linear equations 28N 5. Solve equations with variables on both sides 7S7 6. Solve equations: complete the solution EVP 7. Solve linear equations: mixed review DN6 **Linear inequalities** 8. Identify solutions to inequalities 5UE 9. Solve one-step linear inequalities: addition and subtraction RZV

10. Solve one-step linear inequalities: multiplication and division BRJ

11. Solve one-step linear inequalities EEX

12. Solve two-step linear inequalities NPZ

13. Solve advanced linear inequalities 9K8

Compound inequalities
14. Solve compound inequalities GXA

9-12.HSA-REI.B.4: Solve quadratic equations in one variable.

9-12.HSA-REI.B.4a: Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.

1. Complete the square RD2

9-12.HSA-REI.B.4b: Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a $\pm$ bi for real numbers a and b.

1. Solve a quadratic equation using square roots ERF

2. Solve a quadratic equation using the zero product property TNM

3. Solve a quadratic equation by completing the square XCL

4. Solve a quadratic equation using the quadratic formula XCF

9-12.HSA-REI.C.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Graphing
1. Solve a system of equations by graphing TSS

2. Solve a system of equations by graphing: word problems BVB

Understand solutions
3. Is (x, y) a solution to the system of equations? LRL

4. Find the number of solutions to a system of equations by graphing HJW

5. Find the number of solutions to a system of equations ACN

6. Classify a system of equations by graphing T2D

Substitution

7. Solve a system of equations using substitution 8P9

8. Solve a system of equations using substitution: word problems US9

Elimination

9. Solve a system of equations using elimination A48

10. Solve a system of equations using elimination: word problems NHR

Any method

11. Solve a system of equations using any method HLV

12. Solve a system of equations using any method: word problems GDQ

9-12.HSA-REI.C.7: Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

1. Systems of linear and quadratic equations 4U9

9-12.HSA-REI.D.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).

1. Relations: convert between tables, graphs, mappings, and lists of points RBG

2. Find values using function graphs QCG

3. Complete a function table from a graph HXF

4. Complete a function table from an equation Z73

5. Interpret the graph of a function: word problems STU

6. Complete a table and graph a linear function JFG

9-12.HSA-REI.D.12: Graph the solutions to a linear inequality in two variables as a half-plane (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.

1. Graph a two-variable linear inequality HHP

2. Solve systems of linear inequalities by graphing SGH

IXL

Seeing Structure in Expressions

Standard	IXL skills
9-12.HSA-SSE.A.1: Interpret expressions that represent a quantity in terms of its context.	
9-12.HSA-SSE.A.1a: Interpret parts of an expression, such as terms, factors, and coefficients.	1. Sort factors of variable expressions ML9 2. Polynomial vocabulary MTT
9-12.HSA-SSE.A.1b: Interpret complicated expressions by viewing one or more of their parts as a single entity.	
9-12.HSA-SSE.A.2: Use the structure of an expression to identify ways to rewrite it.	**Linear expressions** 1. Simplify variable expressions using properties HHR **Numeric expressions with exponents** 2. Evaluate expressions using properties of exponents LRR 3. Identify equivalent expressions involving exponents I EUF 4. Identify equivalent expressions involving exponents II RKA **Polynomial expressions** 5. Simplify variable expressions involving like terms and the distributive property ZXX 6. Powers of monomials 7Q8 7. Factor out a monomial JZL
9-12.HSA-SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	
9-12.HSA-SSE.B.3a: Factor a quadratic expression to reveal the zeros of the function it defines.	**Factor quadratics** 1. Factor quadratics with leading coefficient 1 S9P 2. Factor quadratics with other leading coefficients 7ED 3. Factor quadratics: special cases 56E

Solve quadratics

4. Solve a quadratic equation by factoring CSS

9-12.HSA-SSE.B.3b: Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

1. Characteristics of quadratic functions: equations YJZ

9-12.HSA-SSE.B.3c: Use the properties of exponents to transform expressions for exponential functions.

1. Evaluate an exponential function D6H

Geometry

Congruence

Standard	IXL skills
9-12.HSG-CO.A.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.	1. Angle vocabulary 9U2
9-12.HSG-CO.B.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.	1. Transformations that carry a polygon onto itself RJW

Geometric Measurement with Dimension

Standard	IXL skills
9-12.HSG-GMD.A.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	1. Volume of prisms and cylinders N5F 2. Volume of pyramids and cones 7J3 3. Volume of spheres 62N

Modeling with Geometry

Standard	IXL skills
9-12.HSG-MG.A.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	1. Pythagorean theorem F55
9-12.HSG-MG.A.2: Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	1. Calculate density, mass, and volume YKJ

7.G.B.6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Area

1. Area of rectangles and parallelograms 62H

2. Area of triangles and trapezoids ENE

3. Area of compound figures with triangles MRG

4. Area between two shapes RKC

Volume

5. Volume of cubes and prisms URT

6. Volume of cubes and rectangular prisms: word problems 8WV

Surface area

7. Surface area of cubes and prisms RFP

Similarity, Right Triangles, and Trigonometry

Standard	IXL skills
9-12.HSG-SRT.B.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	**Congruent triangles** 1. SSS and SAS Theorems 48Q 2. ASA and AAS Theorems N94 3. SSS, SAS, ASA, and AAS Theorems LER 4. SSS Theorem in the coordinate plane C5G **Proofs involving congruent triangles** 5. Proving triangles congruent by SSS and SAS VVZ 6. Proving triangles congruent by ASA and AAS 23Z 7. Proving triangles congruent by SSS, SAS, ASA, and AAS SZL 8. Proofs involving corresponding parts of congruent triangles AKL **Isosceles, equilateral, and right triangles** 9. Congruency in isosceles and equilateral triangles HPR 10. Proofs involving isosceles triangles V45 11. Hypotenuse-Leg Theorem VQJ **Similar triangles** 12. Similar triangles and indirect measurement JWK 13. Similarity rules for triangles XJQ

8.G.B.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

Functions

Building Functions

Standard	IXL skills
9-12.HSF-BF.A.1: Write a function that describes a relationship between two quantities.	
9-12.HSF-BF.A.1a: Determine an explicit expression, a recursive process, or steps for calculation from a context.	1. Write linear, quadratic, and exponential functions AFA
9-12.HSF-BF.A.1b: Combine standard function types using arithmetic operations.	1. Add and subtract functions 45B 2. Multiply functions 8PM
9-12.HSF-BF.A.2: Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	1. Write variable expressions for arithmetic sequences 5VF 2. Write variable expressions for geometric sequences XPC 3. Write a formula for a recursive sequence KP9 4. Convert a recursive formula to an explicit formula ZBQ 5. Convert an explicit formula to a recursive formula 42Y

Interpreting Functions

Standard	IXL skills
9-12.HSF-IF.A.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).	**Independent and dependent variables** 1. Identify independent and dependent variables N55 **Identify functions** 2. Identify functions VLL 3. Identify functions: vertical line test HLX **Function tables and graphs** 4. Find values using function graphs QCG 5. Complete a function table from a graph HXF

Domain and range

6. Domain and range of relations 2CG

9-12.HSF-IF.A.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Evaluate a function

1. Evaluate a function R96

2. Evaluate a function: plug in an expression VNZ

Interpret function notation

3. Interpret functions using everyday language U98

Tables and graphs

4. Complete a function table from an equation Z73

5. Complete a function table: quadratic functions LFV

6. Complete a function table: absolute value functions 2DH

9-12.HSF-IF.B.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.

Proportional relationships

1. Identify proportional relationships PAV

2. Find the constant of variation 9TD

3. Graph a proportional relationship DAQ

Linear functions

4. Identify linear functions from graphs and equations VMQ

5. Identify linear functions from tables F5G

6. Find the slope of a graph E7D

7. Slope-intercept form: find the slope and y-intercept R5T

8. Complete a table and graph a linear function JFG

9. Standard form: find x- and y-intercepts 8SN

10. Slopes of parallel and perpendicular lines ADB

Exponential functions

11. Match exponential functions and graphs 72J

Quadratic functions

12. Characteristics of quadratic functions: graphs HW8

Linear, quadratic, and exponential functions

13. Identify linear, quadratic, and exponential functions from graphs   DHB

14. Identify linear, quadratic, and exponential functions from tables   SP5

9-12.HSF-IF.B.5: Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

Exponential functions

1. Domain and range of exponential functions: graphs   ANC

2. Domain and range of exponential functions: equations   DZE

Absolute value functions

3. Domain and range of absolute value functions: graphs   NV7

4. Domain and range of absolute value functions: equations   FCY

9-12.HSF-IF.B.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.

Rate of change

1. Rate of change: tables   PLA

Constant of variation

2. Find the constant of variation   9TD

Slope

3. Find the slope of a graph   E7D

4. Find the slope from two points   MD5

9-12.HSF-IF.C.7: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

9-12.HSF-IF.C.7a: Graph linear and quadratic functions and show intercepts, maxima, and minima.

Linear functions

1. Slope-intercept form: graph an equation   UWB

2. Standard form: graph an equation   U6U

3. Point-slope form: graph an equation   F8H

Quadratic functions

4. Graph quadratic functions in vertex form   C7T

5. Graph quadratic functions in standard form   HMW

9-12.HSF-IF.C.7b: Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

1. Graph an absolute value function TD2

9-12.HSF-IF.C.7c: Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

1. Match polynomials and graphs XJU

9-12.HSF-IF.C.7d: Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

1. Rational functions: asymptotes and excluded values B6J

9-12.HSF-IF.C.7e: Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

1. Match exponential functions and graphs 72J

9-12.HSF-IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

9-12.HSF-IF.C.8a: Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

1. Solve a quadratic equation by factoring CSS
2. Solve a quadratic equation by completing the square XCL

9-12.HSF-IF.C.8b: Use the properties of exponents to interpret expressions for exponential functions.

1. Evaluate an exponential function D6H

9-12.HSF-IF.C.9: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

1. Compare linear functions: graphs and equations EA8
2. Compare linear functions: tables, graphs, and equations GD7

Linear, Quadratic, and Exponential Models

Standard	IXL skills
9-12.HSF-LE.A.1: Distinguish between situations that can be modeled with linear functions and with exponential functions.	
9-12.HSF-LE.A.1a: Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	1. Linear functions over unit intervals L5P 2. Exponential functions over unit intervals S7D 3. Describe linear and exponential growth and decay S7T
9-12.HSF-LE.A.1b: Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	**Linear rate of change** 1. Solve linear equations: word problems UFG 2. Rate of travel: word problems 2C8 **Identify linear functions** 3. Identify linear and exponential functions from graphs UEC 4. Identify linear and exponential functions from tables LZF
9-12.HSF-LE.A.1c: Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	**Exponential growth and decay** 1. Exponential growth and decay: word problems UKG **Identify exponential functions** 2. Identify linear and exponential functions from graphs UEC 3. Identify linear and exponential functions from tables LZF
9-12.HSF-LE.A.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).	**Arithmetic and geometric sequences** 1. Write variable expressions for arithmetic sequences 5VF 2. Write variable expressions for geometric sequences XPC **Slope-intercept form** 3. Slope-intercept form: write an equation from a graph 9GW 4. Slope-intercept form: write an equation A42

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5. Slope-intercept form: write an equation from a table SSE

6. Slope-intercept form: write an equation from a word problem HWM

7. Write linear functions: word problems 9RQ

8. Write an equation for a parallel or perpendicular line 5SH

Point-slope form

9. Point-slope form: write an equation PPE

10. Point-slope form: write an equation from a graph LBX

9-12.HSF-LE.A.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.

9-12.HSF-LE.B.5: Interpret the parameters in a linear or exponential function in terms of a context.

1. Compound interest: word problems QSF

Number and Quantities

Quantities

Standard	IXL skills
9-12.HSN-Q.A.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.	**Customary and metric units** 1. Convert rates and measurements: customary units TXC 2. Convert rates and measurements: metric units 6W2 **Word problems** 3. Scale drawings: word problems 8B7 4. Unit prices with unit conversions LT6 5. Multi-step problems with unit conversions EHV
9-12.HSN-Q.A.3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**Precision** 1. Precision QK9 **Greatest possible error** 2. Greatest possible error TZC 3. Minimum and maximum area and volume 4V9 **Percent error** 4. Percent error LNU 5. Percent error: area and volume XVT

The Real Number System

Standard	IXL skills
9-12.HSN-RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**Rational exponents** 1. Multiplication with rational exponents YG7 2. Division with rational exponents H47 3. Power rule with rational exponents QF8 4. Simplify expressions involving rational exponents 89Q **Radical expressions** 5. Simplify radical expressions ZFF

6. Simplify radical expressions with variables 82V

7. Simplify radical expressions involving fractions VRZ

8. Multiply radical expressions HMX

9. Add and subtract radical expressions DLV

10. Simplify radical expressions using the distributive property 28V

11. Divide radical expressions TYC

12. Simplify radical expressions: mixed review YZC

9-12.HSN-RN.B.3: Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

1. Sort rational and irrational numbers ALH

2. Classify rational and irrational numbers 3S8

3. Properties of operations on rational and irrational numbers C7S

IXL

Statistics and Probability

Conditional Probability and Rules of Probability

Standard	IXL skills
7.SP.C.7a: Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.	1. Probability of simple events ZZB 2. Probability of simple events and opposite events F88
7.SP.C.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	1. Probability of compound events YPQ 2. Identify independent and dependent events 9M6 3. Probability of independent and dependent events NED
7.SP.C.8b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.	1. Compound events: find the number of outcomes HZR 2. Compound events: find the number of sums SCV 3. Find the number of outcomes: word problems EKX

Making Inferences and Justifying Conclusions

Standard	IXL skills
7.SP.A.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	1. Identify representative, random, and biased samples 5V3

Interpreting Categorical and Quantitative Data

Standard	IXL skills
9-12.HSS-ID.A.1: Represent data with plots on the real number line (dot plots, histograms, and box plots).	1. Create bar graphs, line graphs, and histograms EF6
9-12.HSS-ID.A.3: Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	1. Box plots YE9 2. Identify an outlier 87L 3. Identify an outlier and describe the effect of removing it XGC
9-12.HSS-ID.B.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). Recognize possible associations and trends in the data.	1. Find probabilities using two-way frequency tables 93R 2. Find conditional probabilities using two-way frequency tables BZZ
9-12.HSS-ID.C.7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	1. Interpret regression lines SEQ 2. Analyze a regression line of a data set 8D8
9-12.HSS-ID.C.9: Distinguish between correlation and causation.	