

# Proficiency Scales

## Algebra II High School 2020



SOUTHWESTERN UNION

EDUCATION  
Algebra II

## PROFICIENCY SCALES

**Proficiency scales serve as a starting point** for unit planning, creating assessments, delivering instruction, grading, and reporting progress, as well as making teaching visible to students and guiding their growth on the standards. Specifically, a proficiency scale is a continuum or learning progression that articulates distinct levels of knowledge and skills relative to specific standards. It shows teachers and students what proficiency looks like, what knowledge and skills students need to achieve proficiency, and how students might go beyond proficiency.

**A proficiency scale is composed of a series of levels** as follows:

**Score 3.0**—Heart of the proficiency scale; it defines the target content that teachers expect all students to know and be able to do. I CAN statements are provided for this level.

**Score 2.0**—Simpler content; it describes the foundational knowledge and skills that students will need to master before progressing to proficiency.

**Score 4.0**—Challenging content; it provides students the opportunity to go above and beyond expectations by applying their knowledge in new situations or demonstrating understanding beyond what the teacher teaches in class. A generic statement is provided for this level.

**Scores 1.0 and 0.0**—No specific content; 1.0 indicates that a student can demonstrate some knowledge or skill with help from the teacher, but not independently; 0.0 means that, even with help, a student cannot show any understanding. Generic statements are provided for these levels.

**Half-point Scores**—More precise measurement of knowledge and skills that is between two levels. Generic statements are provided for these levels.

**Proficiency scales become** the centerpiece of communication and understanding in the classroom, as well as the common language for discussing learning between teacher and student.

**The proficiency scales are organized** according to the domains and strands in the NAD standards.

**The cognitive rigor or complexity of the 3.0 learning targets** has also been included, for it impacts the selection of instructional activities as well as assessment tasks. The Depth of Knowledge (DOK) model is generally used for this purpose, which is a taxonomy of four levels of cognitive demand. The levels are:

- **Level 1**—Recall
- **Level 2**—Skill/Concept
- **Level 3**—Strategic Thinking
- **Level 4**—Extended Thinking



## **DISCIPLINARY TRANSFER GOALS (MATHEMATICAL PRACTICES)**

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There are a small number of overarching, long-term transfer goals in each subject area. They are meant to be integrated within and across grade-level instruction. Below are the transfer goals for math.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

## **Southwestern Union Conference Secondary Math Committee**

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Steve Estrada — Houston Adventist Academy

Jon Dickerson — Chisholm Trail Academy

Robert Feters — Ozark Adventist Academy

Brian Hack — South Texas Christian Academy

Stan Miller — Sandia View Academy

Todd Nelson — Burton Adventist Academy

Melonie Wolfe — North Dallas Adventist Academy



## OFFICE OF EDUCATION

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### **Algebra II Domains and Corresponding P-Scales**

1. [Creating Equations](#)
2. [Radical Expressions](#)
3. [Rational Expressions](#)
4. [Quadratic Equations](#)
5. [Polynomial Expressions](#)
6. [Zeros and Factors of Polynomials](#)
7. [Properties of functions](#)
8. [Transformations of Functions](#)
9. [Radical and Rational Exponents](#)
10. [Operations with Complex Numbers](#)
11. [Graphs of Equations and Inequalities](#)

## Creating Equations

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	<p><b>The student will:</b></p> <ul style="list-style-type: none"> <li>● Create equations and inequalities with one variable and use them to solve problems (HSA-CED.A.1)</li> <li>● Create equations with two or more variables to represent relationships between quantities (HSA-CED.A.2)</li> <li>● Graph equations on coordinate axes with labels and scales (HSA-CED.A.2)</li> <li>● Represent constraints by equations or inequalities and by systems of equations and/or inequalities (HSA-CED.A.3)</li> <li>● Interpret solutions as viable or non-viable options in a modeling context (HSA-CED.A.3)</li> </ul> <p>The student exhibits no major errors or omissions.</p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p><b>Student will:</b></p> <ul style="list-style-type: none"> <li>● Rearrange formulas to highlight a quantity of interest (HSA-CED.A.4)</li> </ul> <p>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instructed success on 2.0 and 3.0 content	

## Radical Expressions

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: <ul style="list-style-type: none"> <li>•</li> </ul> <b>The student exhibits no major errors or omissions.</b>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will: <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	



## Rational Expressions

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>•</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Quadratic Equations

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● use the method of completing the square to transform any quadratic equation in <math>x</math> into an equation of the form <math>(x-p)^2 = q</math> that has the solutions (HSA-REI.B.4a)</li> <li>● derive the quadratic formula using the method of completing the square (HSA-REI.B.4a)</li> <li>● write complex solutions as <math>a \pm bi</math> for real numbers <math>a</math> and <math>b</math> (HSA-REI.B.4b)</li> <li>● Solve quadratic equations with real coefficients that have complex solutions</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● Solve quadratic equations in one variable (e.g., inspection, taking square roots, the quadratic formula, and factoring) (HSA-REI.B.4b)</li> <li>● Solve quadratic equations in factored form even if the zeroes are complex</li> </ul> <p><b><i>recognize or recall specific terminology:</i></b> quadratic equation, quadratic formula, discriminant, complex numbers, imaginary numbers</p> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Polynomial Expressions

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• interpret complicated expressions by viewing one or more of their parts as a single entity (A.SSE.1b)</li> <li>• rewrite expressions based on the given structure (A.SSE.2)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• identify the parts of an expression (A.SSE.1a)</li> <li>• add, subtract, and multiply polynomials</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Zeros and Factors of Polynomials

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• apply the Remainder Theorem (A.APR.2)</li> <li>• identify zeros/roots of polynomials when suitable factoring is available (A.APR.3)</li> <li>• use the zeros/roots to construct a rough graph of the function defined by the polynomial (A.APR.3)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• recall the Remainder Theorem (A.APR.2)</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Properties of Functions

Standards:

Score 4.0	<p>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.</p> <p>The student will:</p> <ul style="list-style-type: none"> <li>● interpret the zeros, extreme values and symmetry of a quadratic function in context (F.IF.8a)</li> <li>● use the properties of exponents to rewrite an exponential function to emphasize one of its properties (F.IF.8b)</li> <li>● Write the function that describes a parabola in all three forms when given a graph with the <math>x</math>-intercepts, <math>y</math>-intercept, and vertex (F.IF.8b)</li> <li>● Compare properties of two functions represented in different ways (F.IF.9)</li> </ul>	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● use the process of factoring and completing the square in a quadratic function to determine the zeros, extreme values and symmetry of the graph (F.IF.8a)</li> <li>● interpret the components of an exponential function in the context of a problem (F.IF.8b)</li> <li>● compare properties of two functions graphically (F.IF.9)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● distinguish between exponential functions that model exponential growth and decay (F.IF.8b)</li> <li>● identify the components of standard, factored and vertex forms of a quadratic function (F.IF.8b)</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instructed success on 2.0 and 3.0 content	

## Transformations of Functions

Standards:

Score 4.0	<p>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.</p> <p>The student will:</p> <ul style="list-style-type: none"> <li>● Explain why a transformation changes the graph of <math>f(x)</math> (F.BF.3)</li> <li>● Predict the effect of a given <math>k</math> value on a transformation of a function (F.BF.3)</li> <li>● Use transformations to explain whether a function is even or odd (F.BF.3)</li> <li>● Graph the listed transformations when given a graph of secant, cosecant and cotangent functions and a value of <math>k</math> for vertical/horizontal shifts and vertical/horizontal stretches (F.BF.3)</li> </ul>	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● describe the transformation that changed a graph of <math>f(x)</math> into a different graph (F.BF.3)</li> <li>● determine the value of <math>k</math> given the graph of a transformed function (F.BF.3)</li> <li>● graph the listed transformations when given a graph of <math>f(x)</math> and a value of <math>k</math> for vertical/horizontal shifts and vertical/horizontal stretches (F.BF.3)</li> <li>● recognize from a graph if the function is even or odd (F.BF.3)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● use a calculator to generate examples of functions with different <math>k</math> values (F.BF.3)</li> <li>● recognize or recall specific terminology: translate, even function, odd function, rotational symmetry</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Radicals and Rational Exponents

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● rewrite expressions involving radicals and rational exponents using the properties of exponents (N.RN.2)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>● recall each of the rules of exponents</li> <li>● apply the meaning of rational exponents</li> <li>● apply properties of integer exponents</li> <li>● use rules of exponents</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	

## Operations with Complex Numbers

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• add and subtract complex numbers (N.CN.2)</li> <li>• multiply complex numbers using the relation <math>i^2 = -1</math> and the commutative, associative, and distributive properties (N.CN.2)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• multiply binomials</li> <li>• recognize or recall specific terminology: complex number <math>i</math> such that <math>i^2 = -1</math>, and <math>\sqrt{-1} = i</math> (N.CN.1); complex numbers in the form <math>a + bi</math>, where <math>a</math> and <math>b</math> are real (N.CN.1)</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	



## Graphs of Equations and Inequalities

Standards:

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.	
	Score 3.5	In addition to scoring 3.0 performance, partial success at score 4.0 content
Score 3.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• Graph the solution set of a system of linear inequalities in two variables as the intersection of the corresponding half-planes (HSA-REI.D.12)</li> <li>• Explain why the x-coordinates of the points where the graphs of the equations <math>y=f(x)</math> and <math>y=g(x)</math> intersect are the solutions of the equation <math>f(x)=g(x)</math> (HSA-REI.D.11)</li> <li>• Find the approximate solutions of linear, polynomial, rational, absolute value, exponential, and logarithmic functions using technology, tables of values, or successive approximations (HSA-REI.11)</li> </ul> <p><b>The student exhibits no major errors or omissions.</b></p>	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	<p>The student will:</p> <ul style="list-style-type: none"> <li>• Understand that the graph of an equation in two variables is a set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line) (HSA-REI.D.10)</li> <li>• Graph the solution to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality) (HSA-REI.D.12)</li> </ul> <p><b>There are no major errors or omissions regarding the simpler details and processes. However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	with help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	As instruction success on 2.0 and 3.0 content	