

Is your student ready for *Algebra 1: Principles of Secondary Mathematics*?

Your student has reached an exciting and important milestone in their math education! The ability to problem solve and think critically will now be equally as important as the computations they perform. To ensure that your student is prepared for the rigor at this level, we encourage you to reflect on the prerequisite skills below.

- 1) Put a checkmark beside each skill that you are confident your student has mastered.

	Concept	Prerequisite Skill	✓
1	Problem solving/Perseverance	Explain their thinking when solving a problem.	
2	Problem solving/Perseverance	Make an attempt at a problem, even when uncertain of the exact steps necessary to solve (persevere in solving).	
3	Fractions	Write a fraction in simplest form.	
4	Fractions	Write mixed numbers as improper fractions.	
5	Fractions	Perform all operations on fractions, including mixed numbers: adding, subtracting, multiplying, dividing, and raising to a power (simple exponents) with simplified answers.	
6	Order of Operations	Simplify using order of operations, including expressions containing absolute value and exponents.	
7	Order of Operations	Simplify an expression with terms to the second or third power (e.g., 3^2 , 3^3).	
8	Square roots	Simplify square roots containing perfect square numbers.	
9	Solve single variable equations	Solve one- and two-step equations containing variables and integer coefficients.	
10	Solve single variable equations	Solve one- and two-step equations containing variables and fractions (coefficients and/or constant terms).	
11	Solve single variable equations	Use the solution to an equation to evaluate an expression.	
12	Solve single variable equations	Write a one-variable equation from a word problem and solve it.	
13	Solve single variable equations	Create an equation from a word problem.	
14	Solve single variable equations	Solve an equation that has variables on both sides.	
15	Solve single variable equations	Use substitution. This includes checking a solution to a single variable equation.	
16	Inequalities	Solve one- and two-step inequalities, including inequalities with fractional coefficients.	
17	Inequalities	Graph single variable inequalities on a number line.	
18	Geometry	Reference a formula sheet to find an unknown formula.	
19	Geometry	Apply the following formulas for area: triangle, square, rectangle, trapezoid, and circle.	
20	Geometry	Apply the following formulas for perimeter: triangle, square, rectangle, trapezoid, and circle.	
21	Geometry	Apply the following formulas for volume: prism, cone, pyramid, sphere, and cylinder.	
22	Geometry	Label a solution with the correct units.	
23	Math Vocabulary	Use vocabulary such as sum, difference, quotient, product, and other words that determine operations.	
24	Number Relationships	Find the least common multiple (LCM) of a set of numbers.	
25	Number Relationships	Find the greatest common factor (GCF) of a set of numbers.	
26	Number Relationships	Name all factors of a number.	
27	Number Relationships	Use proportions to solve problems.	
28	Coordinate Plane	Name each quadrant and axis of the coordinate plane.	
29	Coordinate Plane	Plot ordered pairs, (x, y) , in any quadrant of the coordinate plane.	
30	Coordinate Plane	Determine the horizontal or vertical distance between ordered pairs (points) on the coordinate plane.	
31	Complete a table of values	Given an equation with two variables, use the substitution property to find a missing variable.	
32	Complete a table of values	Complete a table by solving for the missing values.	

- 2) If all of the skills are checked, your student is ready to begin! If you are not confident that your student has mastered a skill, consider using the Readiness Check on the following pages to investigate further.

Algebra 1: Principles of Secondary Mathematics

Readiness Check

The Readiness Check is a tool to help you determine if your student is prepared for *Algebra 1: Principles of Secondary Mathematics*.

How to Administer

Read these instructions completely before your student begins.

- 1) Determine whether your student will be completing the entire Readiness Check or only the problems for a specific skill. The Solutions pages list the skills evaluated in each problem.
- 2) Print the student pages of the Readiness Check and the Formula Sheet.
- 3) Keep the environment comfortable and distraction free. This will yield the most accurate results.
- 4) Provide your student with the student pages of the Readiness Check, the Formula Sheet, and a pencil. Have your student complete the problems on their own without assistance. If needed, you may read the problems out loud to your student.
 - Your student can use the Formula Sheet at any time.
 - Do not allow your student to use a calculator.
 - Encourage the student to do their best, even if they are unsure how to solve a problem. It is important for your student to **attempt** and to **persevere** through each problem.
 - Remind your student to show all of their work and to carefully check for errors.
- 5) The Readiness Check contains two parts. At minimum your student should take a 20 minute break between each part to prevent them from losing focus. They may take additional breaks as needed.

How to score the Readiness Check

- 1) Gather the Solutions and sit next to your student.
- 2) Ask your student to explain their work for each problem. Encourage your student to correct mistakes. If you are comfortable with the material, ask questions to clarify your student's explanation. Use the notes provided in the Solutions as question prompts.
- 3) As your student talks through each problem, determine if your student understood how to solve the problem and did so accurately.
 - If your student can explain their process and accurately answer the problem, move on to the next problem.
 - If your student struggles, circle the problem number or note the problem number on a separate piece of paper.
 - Regardless of the results, keep a positive tone and be sure to point out areas where your student clearly worked hard.
- 4) For each problem your student struggled with, note the prerequisite skill numbers listed on the Solutions pages. The numbers match the prerequisite skills on the first page, as well as the available Bridge Material for that skill. It is recommended that the student complete Bridge Material for any skill they struggled with.

These guidelines have been provided to determine which skills your student needs to develop. However, only you as the instructor can fully determine if your student has all the skills necessary for success.

Part 1

Do not use a calculator. Show all your work. Reference your Formula Sheet as needed.

Evaluate. Write answers in simplest terms.

1) $3\frac{1}{2} \div 4\frac{1}{3}$

$$\frac{7}{2} \div \frac{13}{3} = \frac{7}{2} \cdot \frac{3}{13} = \frac{21}{26}$$

Skill: 3, 4, 5

2) $\frac{7}{8} - \frac{5}{12}$

$$\frac{21}{24} - \frac{10}{24} = \frac{11}{24}$$

Skill: 3, 5

3) $|6 - 10| + 2^3 - (4 + 2)^2 \div 6 + \sqrt{81}$

$$|-4| + 8 - (6)^2 \div 6 + 9$$

$$4 + 8 - 36 \div 6 + 9$$

$$12 - 6 + 9$$

15

◀ Remember that the order of operations is from left to right, completing all multiplication and division before moving to addition and subtraction.

Skill: 6, 7

▼ Problems 4–5 dig deeper into order of operations, exponents, and how the use of parentheses can change the value of a problem.

- 4) Evaluate: -7^2
Is the answer positive or negative?
Explain your reasoning.

−49

The answer is negative because $(-1)(7)(7)$ only has one negative number.

▲ Order of operations dictates that you clear exponents before multiplying. This means that you simplify 7^2 and then multiply by -1 .

Skill: 1, 6, 7

- 5) Evaluate: $(-3)^4$
Is the answer positive or negative?
Explain your reasoning.

81

The answer is positive because an even number of negatives results in a positive value.

$$(-3)(-3)(-3)(-3) = 81$$

Skill: 1, 6, 7

- 6) At Floyd's Family Farm the ratio of chickens to goats was seven to eight. If the farm owned 14 goats, how many chickens do they own? Show your work.

$$\frac{c}{g} = \frac{7}{8}$$

$$\frac{7}{8} = \frac{c}{14}$$

$$8c = 98$$

$$c = 12.25$$

The Farm owns 12 chickens since you cannot have a fraction of a chicken.

▲ Your student should round their answer down since there cannot be a fraction of a chicken.

Skill: 1, 5, 9, 10, 12, 13, 26

- 7) Given $3x - 4 = 17$ and $\frac{1}{2}y + 2 = 5$, find the **sum** of x and y . Show your work.

$$\begin{array}{r}
 3x - 4 = 17 \\
 +4 \quad +4 \\
 \hline
 (\frac{1}{3})(3x) = (21)(\frac{1}{3}) \\
 x = 7
 \end{array}
 \qquad
 \begin{array}{r}
 \frac{1}{2}y + 2 = 5 \\
 -2 \quad -2 \\
 \hline
 \frac{1}{2}y = 3 \\
 (\frac{2}{1})\frac{1}{2}y = 3(2) \\
 y = 6
 \end{array}
 \qquad
 \begin{array}{l}
 \text{Sum of } x \text{ and } y: \\
 x + y \\
 7 + 6 = 13
 \end{array}$$

◀ Your student should solve each equation, then use the values to find the sum. If their values are incorrect from their equations, the sum should use the values that your student originally found.

Skill: 1, 9, 10, 11, 23

- 8) Solve. Show all your work. Check your solution.

$$\begin{array}{r}
 -\frac{5}{2}(x - 2) = 15 \\
 -\frac{5}{2}x + 5 = 15 \\
 -5 \quad -5 \\
 \hline
 (\frac{-2}{5})(-\frac{5}{2}x) = (10)(\frac{-2}{5}) \\
 x = -4
 \end{array}
 \qquad
 \begin{array}{l}
 \text{Check} \\
 -\frac{5}{2}(-4 - 2) = 15 \\
 -\frac{5}{2}(-6) = 15 \\
 15 = 15
 \end{array}$$

◀ Checking their solution shows that your student can make sense of their work and use substitution correctly.

Skill: 1, 5, 10, 11, 15

- 9) Find the error, describe it, and then solve the equation correctly.

$$\begin{array}{r}
 \frac{3}{4}x - 5 = 2 \\
 +5 \quad +5 \\
 \hline
 \frac{3}{4}x = 7 \\
 -\frac{3}{4} \quad -\frac{3}{4} \\
 \hline
 x = 6\frac{1}{4}
 \end{array}
 \qquad
 \begin{array}{l}
 \text{The highlighted step is incorrect. The} \\
 \text{reciprocal of } \frac{3}{4} \text{ should be multiplied on} \\
 \text{both sides instead of subtracting } -\frac{3}{4} \\
 x = 7\left(\frac{4}{3}\right) = \frac{28}{3} = 9\frac{1}{3}
 \end{array}$$

Skill: 1, 3, 5, 10, 11, 23

- 10) Write an equation and solve.
Three times a number (n) is equal to four times the same number minus two.

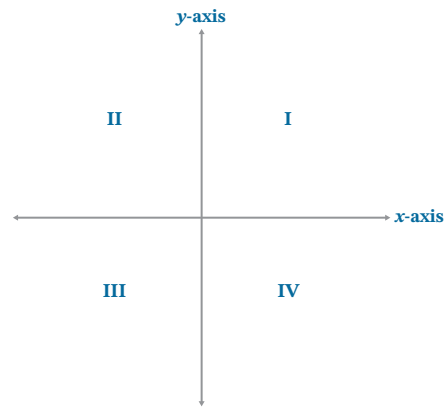
$$\begin{array}{r}
 3n = 4n - 2 \\
 -4n \quad -4n \\
 \hline
 (-1)(-n) = (-2)(-1) \\
 n = 2
 \end{array}$$

◀ If your student writes the equation incorrectly but solves their equation correctly, they have shown perseverance.

Skill: 9, 12, 13, 14, 23

- 11) Label the quadrants on the coordinate plane. Then, label the x - and y -axis.

Skill: 28



List all the factors of each number. Circle any factors that are a perfect square.

- 12) 49

①, 7, ④9

Skill: 8, 23, 26

- 13) 48

①, 2, 3, ④, 6, 8, 12, ⑩6, 24, 48

Skill: 8, 13, 26

- 14) Evaluate when $x = -3$ and $y = 2$:
 $-2x^2y^3$

$$-2(-3)^2(2)^3$$

$$-2(9)(8)$$

$$-144$$

▲ Your student needs to follow the order of operations and use substitution correctly.

Skill: 6, 7, 15

- 15) Given $3x - 5 = 10$, what is $2 - 5x$?

$$3x - 5 = 10$$

$$+5 \quad +5$$

$$\left(\frac{1}{3}\right)(3x) = (15)\left(\frac{1}{3}\right)$$

$$x = 5$$

$$2 - 5(5)$$

$$2 - 25$$

$$\text{answer: } -23$$

▲ Your student should solve the equation $3x - 5 = 10$, then substitute the x -value into the expression $2 - 5x$.

Skill: 1, 9, 11, 15

Part 2

Do not use a calculator. Show all your work. Reference your Formula Sheet as needed.

Do not erase your work. Show *all* attempts on your paper.

- 16) Using the values 1, 4, and 7 only once, find the combination that yields the *smallest* solution. Explain your thinking.

$$5 = \boxed{}x - \boxed{}$$

Solution:

$$\begin{aligned} 5 &= \frac{7}{1}x - 4 \\ +4 &\quad +4 \\ \left(\frac{1}{7}\right)(9) &= (7x)\left(\frac{1}{7}\right) \\ \frac{9}{7} &= x \end{aligned}$$

The smallest number comes from dividing by the largest possible number: 7.

◀ Your student can try a variety of possibilities:

$$\begin{aligned} 5 &= \frac{7}{4}x - 1; x = \frac{24}{7} \\ 5 &= \frac{4}{7}x - 1; x = \frac{21}{2} \\ 5 &= \frac{1}{7}x - 4; x = 63 \\ 5 &= \frac{1}{4}x - 7; x = 48 \\ 5 &= \frac{4}{1}x - 7; x = 3 \end{aligned}$$

Your student should make at least 2, but preferably 3 attempts to confirm that they have the smallest possible solution. Answers do not need to be written as mixed numbers.

Your student can explain their thinking verbally or in writing for this problem.

Skill: 1, 2, 3, 5, 9, 10, 13, 15

- 17) Name the GCF and LCM of 12 and 15.

$$\text{GCF}(12, 15) = 3$$

$$12 = 2 \cdot 2 \cdot 3$$

$$15 = 3 \cdot 5$$

$$\text{LCM}(12, 15) = 60$$

$$12: 12, 24, 36, 48, 60, \dots$$

$$15: 15, 30, 45, 60, \dots$$

Skill: 24, 25

- 18) The length (l) of a rectangle is twice the width (w). Find the *area* when the perimeter of the rectangle is 54 units. Refer to your Formula Sheet.

$$P = 2l + 2w$$

$$A = lw$$

$$l = 2w$$

$$A = (18)(9)$$

$$54 = 2(2w) + 2w$$

$$A = 162$$

$$54 = 4w + 2w$$

The area of the rectangle is 162 square units.

$$54 = 6w$$

$$w = 9 \text{ units}$$

$$l = 18 \text{ units}$$

- ▲ Using the Formula Sheet to find the perimeter formula should help your student understand where to substitute values. They may also want to draw a figure and test values until they find the correct answer. If this is the case, they should not erase their incorrect answers so their thinking can be understood.

After your student finds the dimensions of the rectangle, they can use the formula to find the area of the rectangle.

Skill: 1, 2, 9, 13, 14, 15, 18, 19, 20, 22

- 19) Plot and label the points to create a triangle. Use your graph to determine the base and height and find the area of the triangle. Remember to include the proper units.

$$A: (-3, -1)$$

$$B: (4, 5)$$

$$C: (4, -1)$$

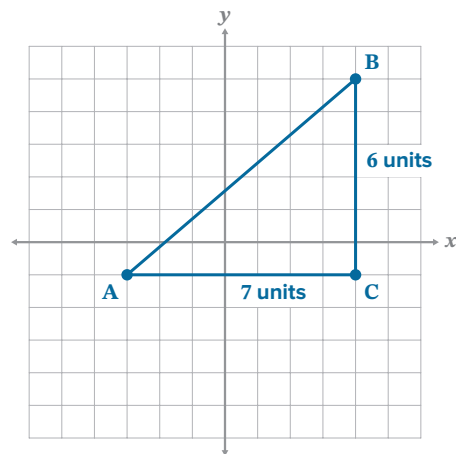
$$b = 7$$

$$h = 6$$

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(7)(6)$$

$$A = 21 \text{ square units}$$



- ▲ Use the base and height your student writes to determine if they can find the area of a triangle.

Skill: 4, 14, 18, 19, 22, 29, 30

Solve. Show all your work. Check your work.

20) $3x + 4 - 5x = 1$

$$-2x + 4 = 1$$

$$-4 \quad -4$$

$$\left(\frac{-1}{2}\right)(-2x) = (-3)\left(\frac{-1}{2}\right)$$

$$x = \frac{3}{2}$$

Check

$$3\left(\frac{3}{2}\right) + 4 - 5\left(\frac{3}{2}\right) = 1$$

$$\left(\frac{3}{2}\right) + 4 - 5\left(\frac{3}{2}\right) = 1$$

$$\frac{9}{2} + 4 - \frac{15}{2} = 1$$

$$\frac{9}{2} + \frac{8}{2} - \frac{15}{2} = \frac{2}{2}$$

$$\frac{2}{2} = \frac{2}{2}$$

◀ **Be sure to have your student check their work. This is part of completing the problem.**

Skill: 3, 5, 9, 11, 15

Solve the inequality. Graph the solution(s) on the number line.

21) $x + 4 < 5$

$$-4 \quad -4$$

$$x < 1$$



Skill: 16, 17

- 22) If the volume of a rectangular pyramid is 32 and the length is 4 and the width is 2, find the height. Write the formula and solve. Use your Formula Sheet and show your work.

$$V = \frac{1}{3}lwh$$

$$32 = \frac{1}{3}(4)(2)h$$

$$32 = \frac{8}{3}h$$

$$\left(\frac{3}{8}\right)(32) = \left(\frac{3}{8}\right)\left(\frac{8}{3}h\right)$$

$$h = 12 \text{ units}$$

◀ **Most problems ask for the volume. This is asking for the missing height to determine if your student can work backwards through a formula.**

Skill: 4, 10, 13, 14, 15, 19, 21, 22

- 23) Complete the table of values for the equation: $y = 3x - 4$

x	work for $y = 3x - 4$	y
-1	$3(-1) - 4$	-7
0	$3(0) - 4$	-4
1	$3(1) - 4$	-1
2	$3(2) - 4$	2

Skill: 9, 14, 31, 32

- 24) Describe the pattern for the x - and y -values from the table.

As the x -value increases by 1, the y -value increases by 3.

Skill: 1, 27

Part 1

Do not use a calculator. Show all your work. Reference your Formula Sheet as needed.

Evaluate. Write answers in simplest terms.

1) $3\frac{1}{2} \div 4\frac{1}{3}$

2) $\frac{7}{8} - \frac{5}{12}$

3) $|6 - 10| + 2^3 - (4 + 2)^2 \div 6 + \sqrt{81}$

4) Evaluate: -7^2
Is the answer positive or negative?
Explain your reasoning.

5) Evaluate: $(-3)^4$
Is the answer positive or negative?
Explain your reasoning.

6) At Floyd's Family Farm the ratio of chickens to goats was seven to eight. If the farm owned 14 goats, how many chickens do they own? Show your work.

7) Given $3x - 4 = 17$ and $\frac{1}{2}y + 2 = 5$, find the **sum** of x and y . Show your work.

8) Solve. Show all your work. Check your solution.

$$-\frac{5}{2}(x - 2) = 15$$

Check

9) Find the error, describe it, and then solve the equation correctly.

$$\frac{3}{4}x - 5 = 2$$

$$+5 \quad +5$$

$$\frac{3}{4}x = 7$$

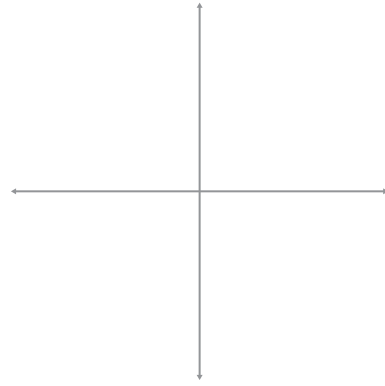
$$-\frac{3}{4} \quad -\frac{3}{4}$$

$$x = 6\frac{1}{4}$$

10) Write an equation and solve.

Three times a number (n) is equal to four times the same number minus two.

- 11) Label the quadrants on the coordinate plane.
Then, label the x - and y -axis.



List all the factors of each number. Circle any factors that are a perfect square.

12) 49

13) 48

14) Evaluate when $x = -3$ and $y = 2$:
 $-2x^2y^3$

15) Given $3x - 5 = 10$, what is $2 - 5x$?

Part 2

Do not use a calculator. Show all your work. Reference your Formula Sheet as needed.

Do not erase your work. Show *all* attempts on your paper.

- 16) Using the values 1, 4, and 7 only once, find the combination that yields the *smallest* solution. Explain your thinking.

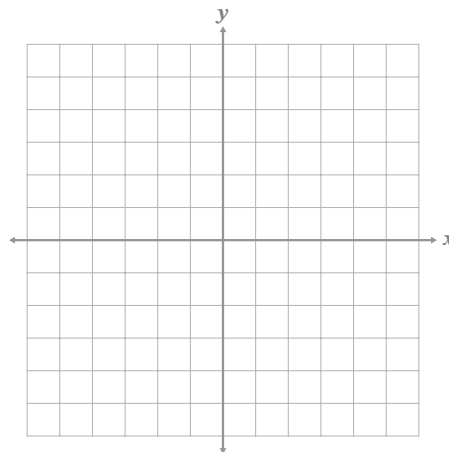
$$5 = \frac{\boxed{}}{\boxed{}}x - \boxed{}$$

-
- 17) Name the GCF and LCM of 12 and 15.

- 18)** The length (l) of a rectangle is twice the width (w). Find the *area* when the perimeter of the rectangle is 54 units. Refer to your Formula Sheet.

- 19)** Plot and label the points to create a triangle. Use your graph to determine the base and height and find the area of the triangle. Remember to include the proper units.

A: $(-3, -1)$
B: $(4, 5)$
C: $(4, -1)$



Solve. Show all your work. Check your work.

20) $3x + 4 - 5x = 1$

Check

Solve the inequality. Graph the solution(s) on the number line.

21) $x + 4 < 5$



22) If the volume of a rectangular pyramid is 32 and the length is 4 and the width is 2, find the height. Write the formula and solve. Use your Formula Sheet and show your work.

23) Complete the table of values for the equation: $y = 3x - 4$

x	work for $y = 3x - 4$	y
-1		
0		
1		
2		

24) Describe the pattern for the x - and y -values from the table.

Student Formula Sheet

Figures and Formulas:

Perimeter (P), Area (A), and Volume (V)

Rectangle

$$A = lw \text{ or } A = bh$$

$$P = 2l + 2w \text{ or } P = 2(l + w)$$

Triangle

$$A = \frac{1}{2}bh \text{ or } A = \frac{bh}{2}$$

Rectangular Prism

$$V = lwh$$

Volume of a Rectangular Pyramid

$$V = \frac{1}{3}lwh$$

Other Formulas

Distance

$$\text{distance} = \text{rate} \cdot \text{time}$$

$$d = rt$$