

GOOD AND BEAUTIFUL
ALGEBRA
READINESS TEST

Parent/Teacher Instructions

★ **SUPPLIES NEEDED:** scratch paper, calculator



This test is designed to assess a student's readiness for an Algebra 1 course. It contains concepts taught in *Simply Good and Beautiful Math* through *Pre-Algebra (Math 8)*, though some concepts in the course may not be included. This test should be used as one piece of information in an overall evaluation of a student's math readiness and progression.

If a student is proficient in all concepts taught in this assessment, they should be ready for an Algebra 1 course. However, students who have taken *Simply Good and Beautiful Pre-Algebra* do not need to take this test. They will be prepared for Algebra 1 if they completed and did well in *Simply Good and Beautiful Pre-Algebra*.

Please note that math continually builds, and concepts are repeated in courses. The material contained in this assessment will likely be present to some degree in any Algebra 1 course. If a student completed *Simply Good and Beautiful Pre-Algebra* and has a firm grasp of most of the concepts in this assessment, even though some mistakes may have been made, they should do well in an Algebra 1 course.

However, if a student did not take *Simply Good and Beautiful Pre-Algebra* and desires to begin an Algebra 1 course, this test can be used as an indicator of a student's readiness.

Scoring the Assessment

An answer key is provided at the end of the test to check the student's responses. To score, place a check mark for each correct response in the circle next to each answer on the student assessment. Write the total number of check marks in the circle below.

There are 80 points possible for this test. If the score is 60 or greater, the student is ready to begin an Algebra 1 course. If the score is 59 or less, it is recommended to review the concepts the student has not yet mastered before beginning an Algebra 1 course.

Total number of check marks:



Assessment

1. Perform the indicated operations.

a. $18\frac{1}{3} - 9\frac{4}{5}$

☐ _____

b. $-15.25 \div (-2.5)$

☐ _____

2. Use the distributive property to rewrite the expression without parentheses.

$$-12(4x + 7y - 11)$$

☐ _____

3. Write the prime factorization of 264 using exponents.

☐ $264 =$ _____

4. Evaluate the expression.

$$\frac{63 - (4^2 + 9 \cdot 3)}{-2^3 + 48 \div 4}$$

☐ _____

5. Evaluate the expression when $q = 6$ and $t = -4$.

$$18q - t^3$$

☐ _____

6. Simplify each expression using exponent rules.

a. $p^{23} \div p^{12}$ ☐ _____

b. $s^9 \cdot s^8 \cdot s$ ☐ _____

c. $\left(\frac{m^5}{n^6}\right)^4$ ☐ _____

7. Evaluate each expression. Write each answer as a fraction in simplest form.

a. $\frac{2\sqrt[3]{-27}}{\sqrt{144}}$ ☐ _____

b. $\left(\frac{8}{5}\right)^{-2}$ ☐ _____

8. Simplify each expression.

a. $14\sqrt{7} - 29\sqrt{7}$ ☐ _____

b. $8\sqrt{10} + \sqrt{2} \cdot \sqrt{5}$ ☐ _____

c. $3\left(\left(\frac{1}{3}z\right)^2 - 2z - 15\right) + \frac{2}{3}z^2 + 6z$

☐ _____

9. Write each number in scientific notation.

a. 0.00000987 ☐ _____

b. 26,340,000,000 ☐ _____

10. Perform each operation. Write answers in scientific notation.

a. $(7.02 \times 10^{16}) + (2.9 \times 10^{15})$

☐ _____

b. $(8.8 \times 10^{-7}) \div (2 \times 10^{-13})$

☐ _____

11. Solve each equation.

a. $24a - 16 = 56$

☐ $a = \underline{\hspace{2cm}}$

b. $\frac{2.5(4h - 2)}{-5} = -13$

☐ $h = \underline{\hspace{2cm}}$

c. $-15j + 31 = 12j - (-193)$

☐ $j = \underline{\hspace{2cm}}$

12. The formula $P = 2l + 2w$ is used to find the perimeter of a rectangle when the length and width are known.

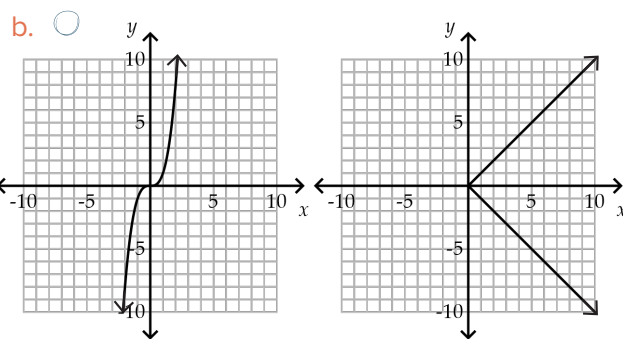
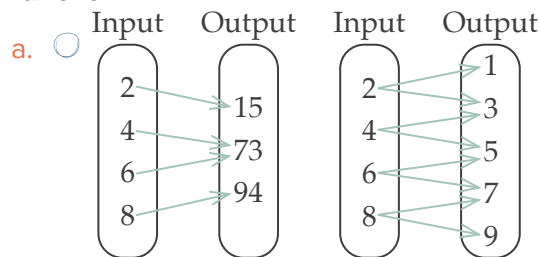
a. Solve for l in the given perimeter formula.

☐ $\underline{\hspace{2cm}}$

b. Use the formula to find the length of a rectangle with a perimeter of 123.5 cm and a width of 41.5 cm.

☐ $\underline{\hspace{2cm}}$

13. Circle the relation in each row that is a function.



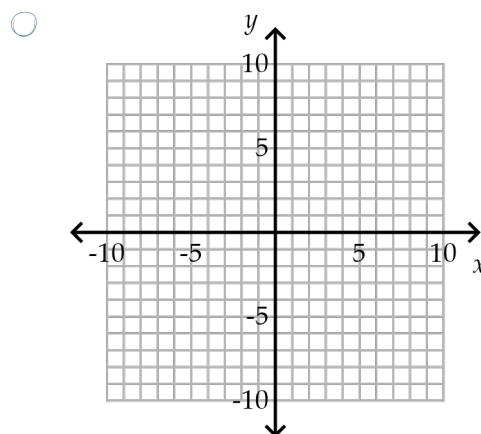
14. Circle the relation in each row that is a **linear** function.

a. ☐ $y = x^3$ $y = x + 3$

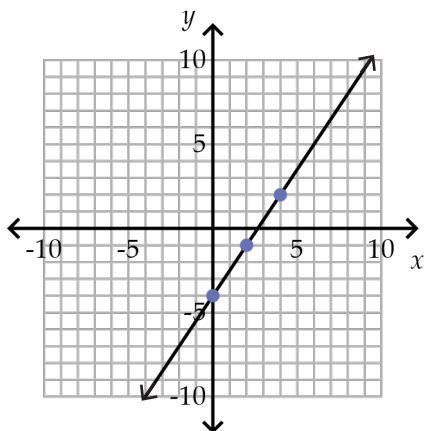
b. ☐

x	y	x	y
1	1	0	5
2	4	1	8
3	9	2	11

15. Graph $y = -2x + 5$.



16. Write the equation of the line below in slope-intercept form.

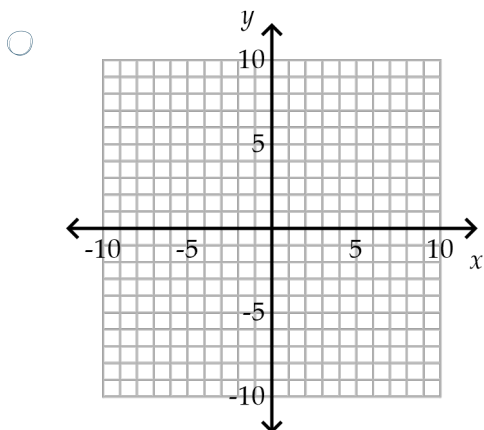


☐ _____

17. Write the equation of the line that passes through the points $(-2, 47)$ and $(6, -49)$.

☐ _____

18. Graph $4x - 5y = 40$.



19. Write the linear equation in slope-intercept form.

$$-8x + 10y = 20$$

☐ _____

20. Emily's grandfather opens a savings account for her education. He deposits \$315 when he opens the account, and Emily adds \$25 per month to the account.

a. Write an equation in slope-intercept form to model the amount of money in Emily's savings account (y) after x months.

☐ _____

b. In how many months will Emily have \$1,465 in her account?

☐ _____ months

21. Solve for the variable in each equation.

a. $\sqrt[3]{t} - 9 = -11$

☐ $t =$ _____

b. $r^2 - 83 = 86$

☐ $r =$ _____

22. Determine if the side lengths form a right triangle. Write "yes" or "no" on the line.

3 in, 5 in, 8 in

☐ _____

23. a. Find the distance between the points below. Round to the nearest hundredth.

$(-2, 7)$ and $(14, -4)$

☐ _____

- b. Find the midpoint of the line segment that has the endpoints given in Part A.

☐ _____

24. 80 is what percent of 50?

☐ _____

25. Georgia spent 16 hours volunteering at a care center this month. If she spent 10 hours volunteering last month, what is the percent of change in her volunteer hours?

☐ _____

26. A savings account starts with \$1,100. Find the final amount in the account after 13 years of 2.5% interest compounded annually.

♦ Hint: The formula for compound interest is $A = P(1 + r)^t$ where A is the final amount, P is the principal (starting) amount, r is the interest rate (as a decimal), and t is the time in years.

☐ _____

27. A box of small bags of potato chips contains 6 ranch-flavored bags, 6 cheese-flavored bags, 4 barbecue-flavored bags, and 4 plain bags.

- a. If you pull out one bag at random, what is the probability that it will be cheese-flavored chips? Write the answer as a simplified fraction.

☐ _____

- b. Find the expected number of bags of each flavor that would likely be in a random selection of 10 bags.

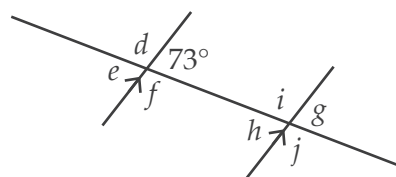
☐ ranch: _____

☐ barbecue: _____

28. Use the conversion $1 \text{ kg} \approx 2.2 \text{ lb}$ to determine the weight in kg (to the nearest hundredth) of an 8 lb newborn baby.

☐ _____

29. Use the given angle and angle relationships to find the measure of each angle in the figure below.



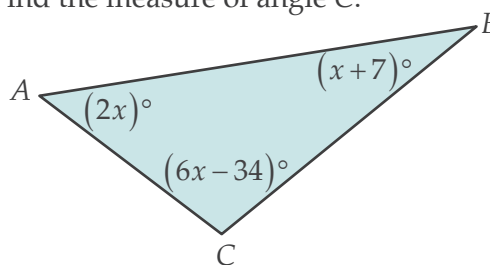
☐ $m\angle d =$ _____

☐ $m\angle e =$ _____

☐ $m\angle g =$ _____

☐ $m\angle i =$ _____

30. Find the measure of angle C.

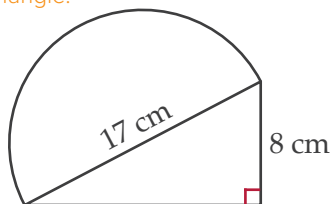


☐ $m\angle C =$ _____

31. Find the area and the perimeter (to the nearest tenth) of the composite shape.

♦ Hint: Use the Pythagorean theorem to find the length of the missing leg of the triangle.

♦ Hint: The formula for the circumference of a circle is $C = 2\pi r$. The formula for the area of a circle is $A = \pi r^2$. Use 3.14 for π .

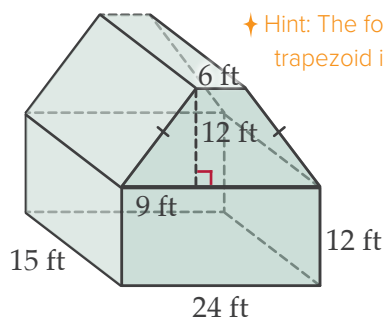


- ☐ Area: _____
- ☐ Perimeter: _____

32. Find the volume and surface area of the mountain cabin shown below.

♦ Hint: Use the Pythagorean theorem to find the length of the hypotenuse of the right triangle in the trapezoid.

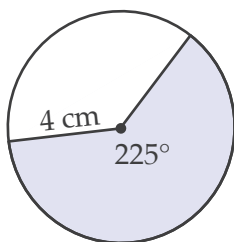
♦ Hint: The formula for the area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$.



- ☐ Volume: _____
- ☐ Surface area: _____

33. To the nearest hundredth, find the length of the arc given by the 225° sector and the area of the sector.

♦ Hint: The formula for the circumference of a circle is $C = 2\pi r$. The formula for the area of a circle is $A = \pi r^2$. Use 3.14 for π .



- ☐ Arc length: _____
- ☐ Sector area: _____

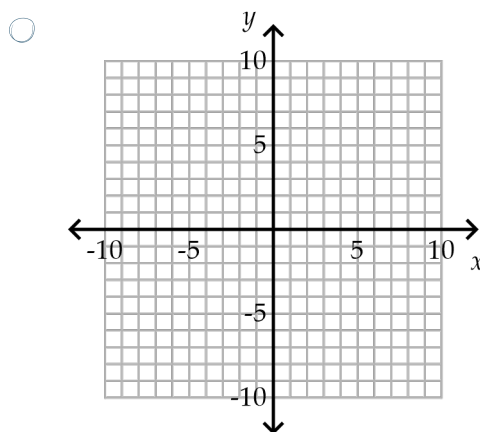
34. Solve and graph the inequality.

$$-5x - 53 < 3x + 19$$

- ☐ _____
- ☐

35. Graph the linear inequality.

$$y < -x + 8$$



36. Solve the equation. Then circle whether the initial equation has one solution, infinite solutions, or zero solutions.

$$-6(4x + 8) = 68 - 24x$$

- ☐ _____
- ☐ Number of solutions: one / infinite / zero

37. Solve the system of equations using substitution or elimination.

$$y - 10x = -20$$

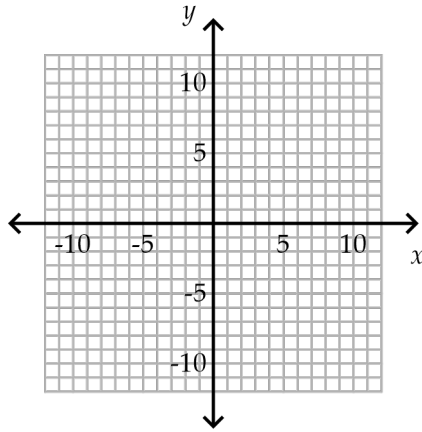
$$y - 5x = 10$$

- ☐ Solution: _____

38. Solve the system of equations by graphing.

$$y = 4x - 6$$

$$y = x + 6$$



☐ Solution: _____

39. Find the coordinates of the transformation specified in the table.

Dilation by a scale factor of $\frac{1}{2}$.			
ordered pair	$(-8, 9)$	$(2, 6)$	$(-4, 2)$
dilation	☐	☐	☐

40. Add $26u^8p^{10} + 7u^3 - 1$ and $-5u^8p^{10} - 7u^3 - 19$.

☐ _____

41. Factor the binomial.

$$56r^2c^9 - 32r^3c^4$$

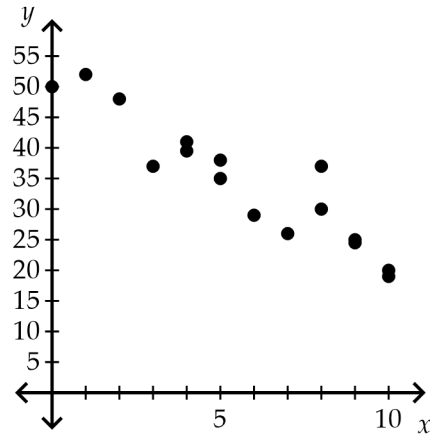
☐ _____

42. Multiply the binomials.

$$(3x - 4)(2x + 5)$$

☐ _____

43. Draw an approximate line of best fit on the scatterplot below. Then circle the types of correlation shown.



- ☐ linear | ☐ nonlinear
☐ positive | ☐ negative
☐ strong | ☐ weak

44. Complete the two-way table. Then use the completed table to answer the questions. When needed, round to the nearest tenth.

	Male	Female	Total
Summer	39	46	☐
Winter	34	☐	65
Total	☐	77	150

- a. What percent of males chose summer?

☐ _____

- b. What percent of the sample were females who chose winter?

☐ _____

45. Determine if the survey questions are biased or unbiased.

- a. Do you prefer summer sports or cold, miserable winter sports?

☐ _____

- b. Do you prefer reading or math?

☐ _____

Answer Key

1. a. $8\frac{8}{15}$

b. 6.1

2. $-48x - 84y + 132$

3. $2^3 \cdot 3 \cdot 11$

4. 5

5. 172

6. a. p^{11}

b. s^{18}

c. $\frac{m^{20}}{n^{24}}$

7. a. $-\frac{1}{2}$

b. $\frac{25}{64}$

8. a. $-15\sqrt{7}$

b. $9\sqrt{10}$

c. $z^2 - 45$

9. a. 9.87×10^{-6}

b. 2.634×10^{10}

10. a. 7.31×10^{16}

b. 4.4×10^6

11. a. 3

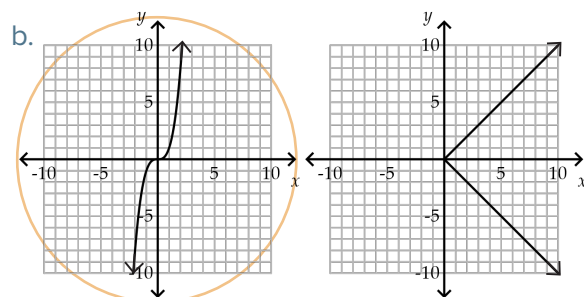
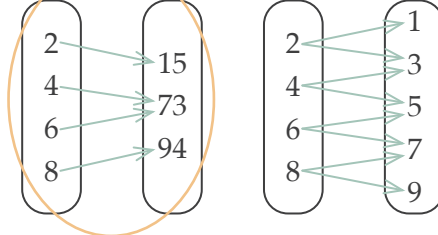
b. 7

c. -6

12. a. $l = \frac{P - 2w}{2}$ or $l = \frac{1}{2}P - w$

b. 20.25 cm

13. a. Input Output Input Output



14. a. $y = x^3$

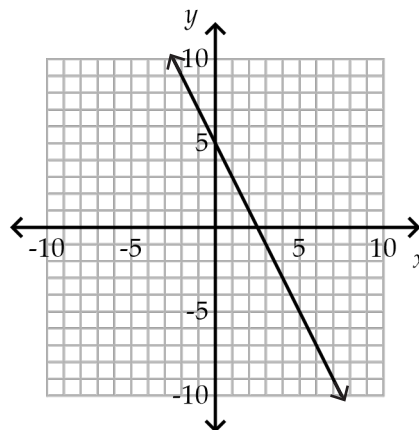
$y = x + 3$

b.

x	y
1	1
2	4
3	9

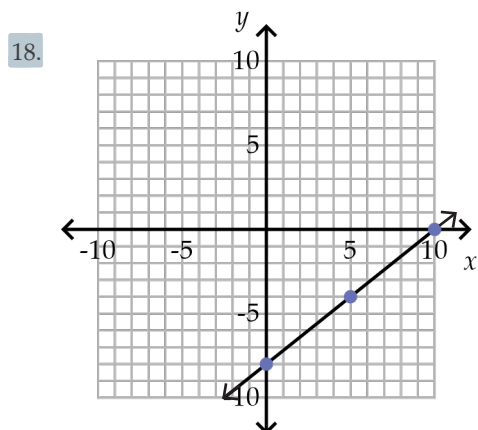
x	y
0	5
1	8
2	11

15.



16. $y = \frac{3}{2}x - 4$

17. $y = -12x + 23$



19. $y = \frac{4}{5}x + 2$

20. a. $y = 25x + 315$

b. 46

21. a. -8

b. 13, -13

22. no

23. a. 19.42 units

b. $\left(6, 1\frac{1}{2}\right)$

24. 160%

25. 60% increase

26. \$1,516.36

27. a. $\frac{3}{10}$

b. ranch: 3

barbecue: 2

28. 3.64 kg

29. $m\angle d = 107^\circ$, $m\angle e = 73^\circ$,
 $m\angle g = 73^\circ$, $m\angle i = 107^\circ$

30. 104°

31. Area: 173.4 cm^2

Perimeter: 49.7 cm

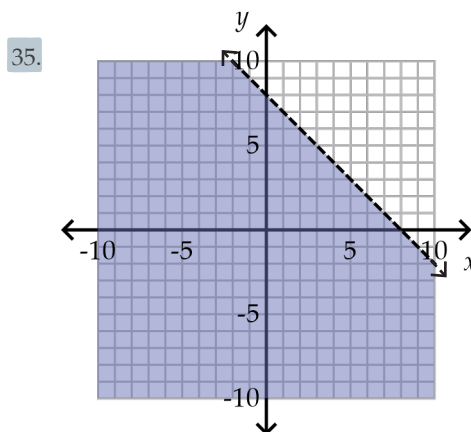
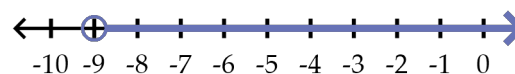
32. Volume: $7,020 \text{ ft}^3$

Surface area: $2,196 \text{ ft}^2$

33. Arc length: 15.7 cm

Sector area: 31.4 cm^2

34. $x > -9$

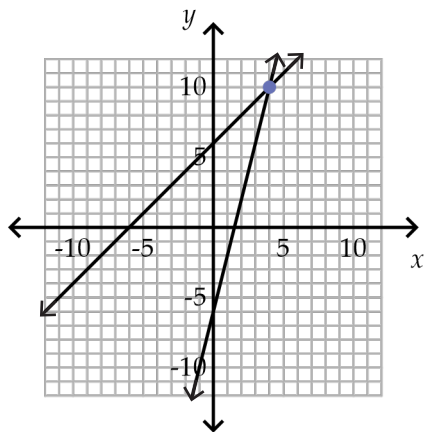


36. no solution

Number of solutions: one/infinite/zero

37. (6,40)

38.



Solution: (4,10)

39.

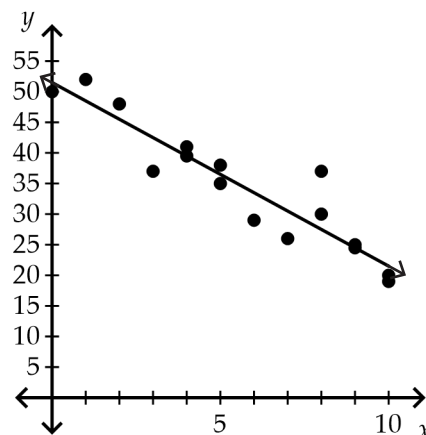
Dilation by a scale factor of $\frac{1}{2}$.			
ordered pair	$(-8,9)$	$(2,6)$	$(-4,2)$
dilation	$(-4,4.5)$	$(1,3)$	$(-2,1)$

40. $21u^8p^{10} - 20$

41. $8r^2c^4(7c^5 - 4r)$

42. $6x^2 + 7x - 20$

43. Note: The placement of the line of best fit may vary. There should be about the same number of points above and below the line.



linear | nonlinear
positive | negative
strong | weak

44.

	Male	Female	Total
Summer	39	46	85
Winter	34	31	65
Total	73	77	150

a. 53.4%

b. 20.7%

45. a. biased

b. unbiased