## ALGEBRA 2 SERIES

Algebra 2 Placement Test

Name_____

This test can help you see if you have learned the main topics in the Algebra 1 Series.

It does not prove that you have mastered the topics in each of the 7 books, but you can use it to see if there are any topics you may still need to learn before you are ready to move on to the 8 books in the Algebra 2 Series.

When you grade the test, if there are topics you haven't yet learned, you can use the Answer Key to see which books teach those topics. You may only need to complete the books that cover those topics before you are ready to start the Algebra 2 Series.

You should complete this test without a calculator. You may need extra paper to give you enough space to work through each scenario.

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1. 40% of 60 is what number?

2. A price was decreased from $200 to $180. By what percent did the price change?

3. The final bill for a new TV is $638.40 after tax is calculated. If the sales tax is 6.4%, what was the original cost of the TV before sales tax was added to the price?

4. A family owns an apple orchard and they sell their apples. Use the graph shown to see how the cost of the apples depends on the total weight of the apples. How much will someone pay for 8 kilograms of apples?
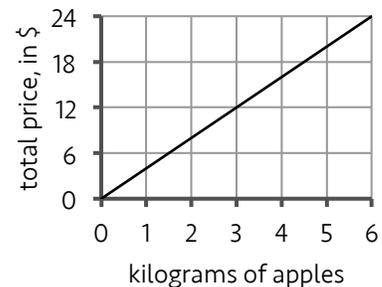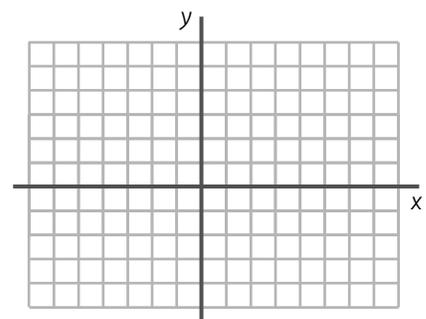

5. What is the slope of the line shown?
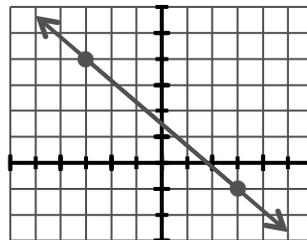
6. Graph the lines on the same Cartesian Plane.
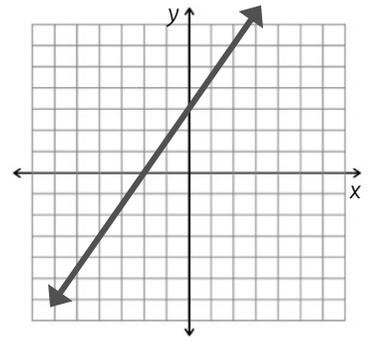
a. $y = \dfrac{3}{4}x - 2$

b. $y = -\dfrac{4}{3}x + 3$

7. Consider the graph shown to the right.

    a. Identify the *x*-intercept of the line shown to the right.

    b. Write the equation of the line, in Slope-Intercept Form.

8. What is the equation of the line that passes through the points $(-1, -4)$ and $(-6, 11)$? Write the equation in Slope-Intercept Form.

9. Simplify each expression as much as you can.

    a. $2x \cdot 3x^2$
    b. $\dfrac{6y^6}{2y^2}$
    c. $\left(-4x^5\right)^3$
    d. $(20y) \cdot \left(2y^{-1}\right)^{-5}$

10. What is the simplified value of $4^0 + 4^{-1}$?

11. What is the simplified value of $x^2 + 3x - 7$ if $x = -10$?

12. Simplify the following expressions. Write the result in Standard Form.

    a. $2(x+7) + 3\left(x^2 - 2x - 5\right)$
    b. $\left(2 - h + h^2\right) - \left(-3 - 5h^2 + 4h\right)$

13. Simplify the following expressions. Write the result in Standard Form.

    a. $(2y-5)(2y+5)$
    b. $\left(8x - \dfrac{1}{2}\right)^2$

14. Factor each expression (write it as a product of binomials).

    a. $x^2 - 8x + 16$
    b. $x^2 - 9$
    c. $2x^2 - 7x - 9$

15. What value(s) of x will make each equation true?

   a. $x^2 + 4x - 12 = 0$

   b. $x^2 + 3x = 0$

16. Use the <u>Substitution Method</u> to find the intersection point of the pair of lines below.
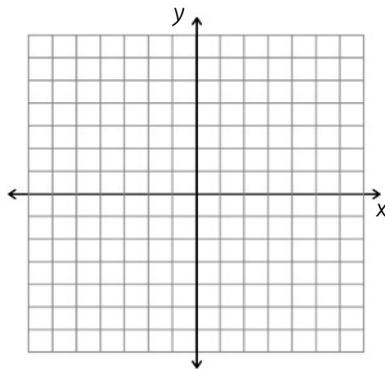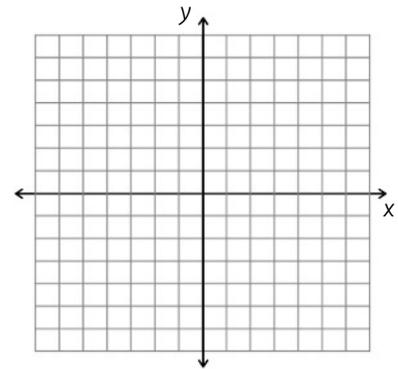
   $-3x - y = 19$
   $20x - 2y = 12$

17. Use the Elimination Method to find the intersection point of the lines $3x + 4y = 14$ and $-5x + 2y = 20$.

18. Graph each system of inequalities.

   a. $y \geq -3$
   $x < 4$

   b. $y \geq \dfrac{3}{4}x + 2$
   $-2x - y > 5$

19. Simplify the following expressions as much as you can.

   a. $\sqrt{32}$

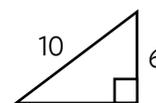   b. $\sqrt{3} + 4\sqrt{3}$

20. Simplify the following expressions.

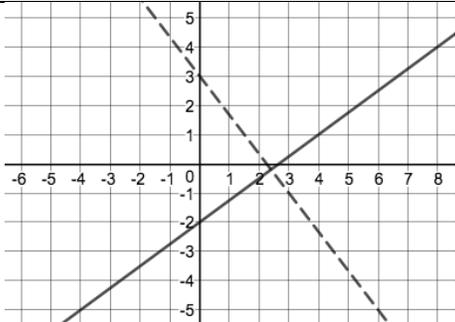   a. $\left(2 + \sqrt{5}\right)\left(2 - \sqrt{5}\right)$

   b. $\left(4 - \sqrt{6}\right)^2$

21. Solve the equation.

   $\sqrt{x - 5} = 3$

22. How long is the unmarked side of the triangle shown?

ANSWER KEY

1.	24
2.	10%
3.	$420.00
4.	$32
5.	$-\dfrac{5}{6}$
6.	The dashed line is $y=-\dfrac{4}{3}x+3$.
7.	a. $\left(-2,0\right)$ b. $y=\dfrac{3}{2}x+3$
8.	$y=-3x-7$
9.	a. $6x^3$ b. $3y^4$ c. $-64x^{15}$ d. $\dfrac{5y^6}{8}$
10.	$1\dfrac{1}{4}$ or $\dfrac{5}{4}$ or 1.25
11.	63
12.	a. $3x^2-4x-1$ b. $6h^2-5h+5$
13.	a. $4y^2-25$ b. $64x^2-8x+\dfrac{1}{4}$
14.	a. $\left(x-4\right)\left(x-4\right)$ or $\left(x-4\right)^2$ b. $\left(x+3\right)\left(x-3\right)$ c. $\left(2x-9\right)\left(x+1\right)$
15.	a. $x=2$ or $x=-6$ b. $x=0$ or $x=-3$
16.	$\left(-1,\ -16\right)$
17.	$\left(-2,\ 5\right)$

18.	The solution region is the shaded region that is darkest. That is the region where the *x*- and *y*-values of a given point make both inequalities true. a. b.
19.	a. $4\sqrt{2}$ b. $5\sqrt{3}$
20.	a. -1 b. $24-8\sqrt{6}$
21.	$x=14$
22.	8
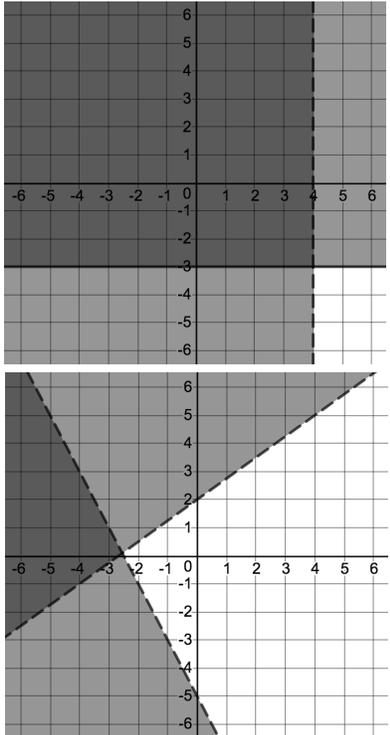
The list below shows which Algebra 1 book teaches each scenario on this test.
Book 1: #1, 2, 3, 4
Book 2: #5, 6, 7, 8
Book 3: #9, 10, 11
Book 4: #12, 13
Book 5: #14, 15
Book 6: #16, 17, 18
Book 7: #19, 20, 21, 22