

Welcome to Algebra 2 Accelerated! In Algebra 1, you learned about functions, including linear, exponential, and quadratic functions, and statistics. In this course, you will continue to work with functions and data to understand phenomena in the natural world. This packet is designed to review and refresh your understanding of a few Algebra 1 topics that will be essential in moving your learning forward in Algebra 2 Accelerated. This packet is due on the second day of classes.

#1–8 should be completed without a calculator.

1. Solve: $\frac{1}{2}(3x - 8) + 4 = 2x - (5x + 1)$

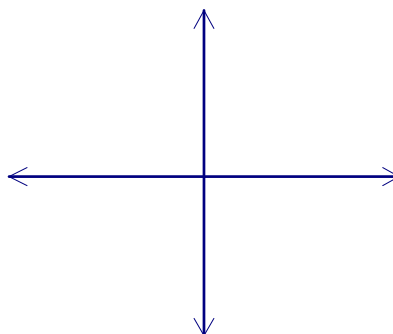
2. Solve for x in terms of a and b : $xa - 3 = 4b + 2$

3. Solve using factoring and zero-product property:
 $3x^2 - 9x + 2 = 4x + 12$

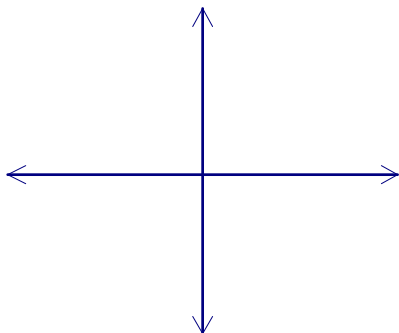
4. Solve using quadratic formula:
 $3x^2 - x - 5 = 0$

5. Re-write the equation in standard form:
 $k(x) = -3(2x - 1)^2 + 7$

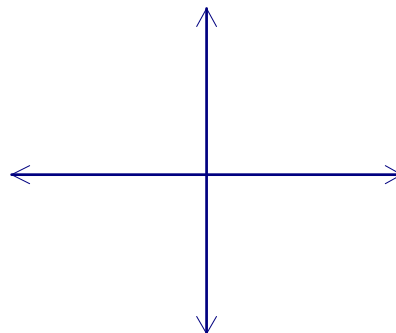
6. Graph, showing x - and y -intercepts:
 $9x - 6y = 36$



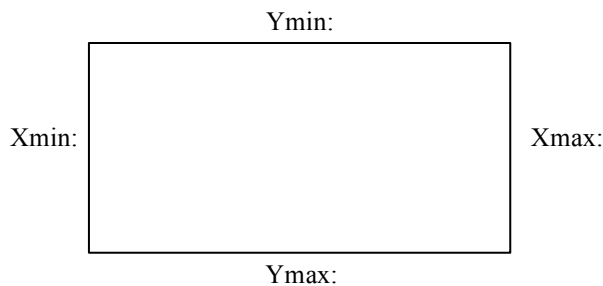
7. Graph, showing asymptote, y -intercept, and at least one other point: $f(x) = 8\left(\frac{1}{2}\right)^x$



8. Graph, showing x -intercepts, y -intercept, and vertex: $g(x) = -2(x-1)(x+5)$



9. Solve the system using your graphing calculator: $\begin{cases} y = 2x^2 - 8x \\ y = 4x - 11 \end{cases}$ Sketch a picture of your graphing screen.



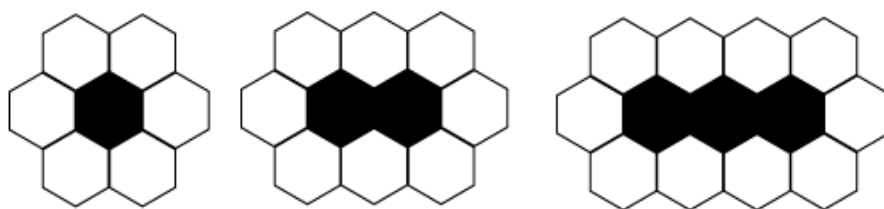
10. At the grocery store, Amy purchased 4 boxes of Cheerios and 3 cartons of orange juice for \$23.50. If a box of Cheerios costs \$1 less than double the price of a carton of orange juice, how much does a box of Cheerios cost?

a) Define your variables and write a system of equations to model the problem.

b) Solve your system using an algebraic method (substitution or elimination):

11. Susanna heard some exciting news about a well-known celebrity. Within a day, she told 4 friends who hadn't heard the news yet. By the next day, each of those friends told 4 other people who also hadn't heard the news. By the next day, each of those people told four more, and so on.
- Assume the rumor continues to spread in this manner. Let N be the function that assigns to d the number of people who heard the rumor on the d^{th} day. Write an expression for $N(d)$.
 - On which day will at least 100,000 people hear the rumor for the first time? Show how you determined your answer.
 - How many people will hear the rumor for the first time on the 20th day? Show how you determined your answer.
 - Is the answer to part c) realistic? Explain your reasoning.

12. Use the figure to answer the questions that follow. Show all work to justify each answer.



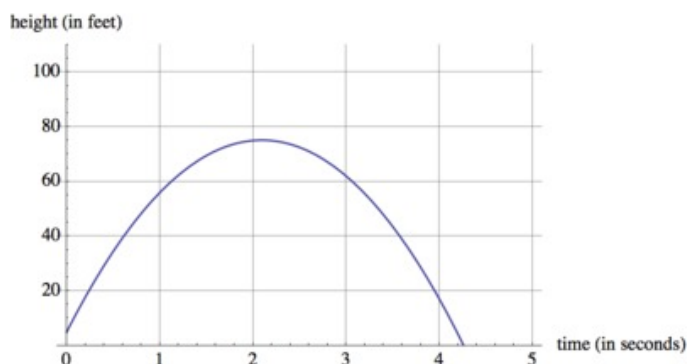
- Assume that the pattern above continues. If a figure has 8 shaded hexagons, how many white hexagons are needed?
- If a figure uses 32 white hexagons, how many shaded hexagons are in the figure?
- Which figure has 29 white hexagons?

13. For this problem, you can solve algebraically, showing all work. Or, you can use a calculator, and explain what you did on your calculator.

Suppose Brett and Andre each throw a baseball into the air.

The height of Brett's baseball, in feet, is given by the function: $h(t) = -16t^2 + 79t + 6$ where t is in seconds.

The height of Andre's baseball is given by the graph at right:



Brett claims that his baseball went higher than Andre's, and Andre says that his baseball went higher.

a) Who is right? Show work to justify your answer.

b) How long is each baseball airborne? Justify your answer.

c) Construct an accurate graph of the height of Brett's throw as a function of time on the same set of axes as the graph of Andre's throw (if not done already), and explain how this can confirm your claims to parts (a) and (b).

Answers:

1. $x = -\frac{2}{9}$
2. $x = \frac{4b+5}{a}$
3. $x = 5, -\frac{2}{3}$
4. $x = \frac{1 \pm \sqrt{61}}{6}$
5. $k(x) = -12x^2 + 12x + 4$
- 6, 7, 8: Use calculator to check.
9. $(1.129, -6.483), (4.871, 8.483)$
- 10b. Cheerios cost \$4/box, Orange juice is \$2.50/carton
- 11a. $N(d) = 4^d$
- 11b. approx. 8.3 days
- 11c. 1,099,511,627,776
- 11d. This exceeds the number of people on earth!
- 12a. 20
- 12b. 14
- 12c. not possible
- 13a. Brett's baseball went higher.
- 13b. Andre: approx. 4.2 sec; Brett: approx. 5 sec