

Name: \_\_\_\_\_  
Algebra 1

Date: \_\_\_\_\_  
Band: \_\_\_\_\_

## Unit 9: Quadratic Functions & Equations Performance Tasks

*Instructions:* Choose one performance task. Write all your work on a separate clean piece of paper and attach it to this page.

### Big Idea: Functions

The family of quadratic functions has equations of the form  $y = ax^2 + bx + c$ , where  $a \neq 0$ . The graph of a quadratic function is a parabola.

#### Performance Task 1

*Solve. Show all your work and explain your steps.*

Suppose you have a quadratic function  $y = ax^2 + bx + c$ , where  $a < -1$ ,  $b = 2a$ , and  $c = -b$ . What do you know about the graph of this function? Justify each detail.

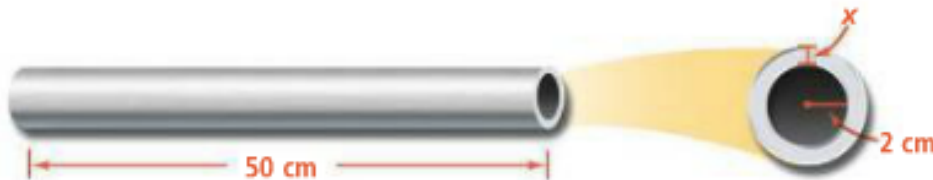
### Big Idea: Solving Equations and Inequalities

You can solve quadratic equations by several methods, including graphing, finding square roots, factoring, completing the square, and using the quadratic formula. Sometimes the characteristics of the equation make one method more efficient than the others.

#### Performance Task 2

*Solve. Show all of your work and explain your steps.*

A manufacturer makes 50-cm lengths of steep pipe. A pip uses  $400 \text{ cm}^3$  of steep and has an inner radius of 2 cm. What is the thickness  $x$  of the pipe?



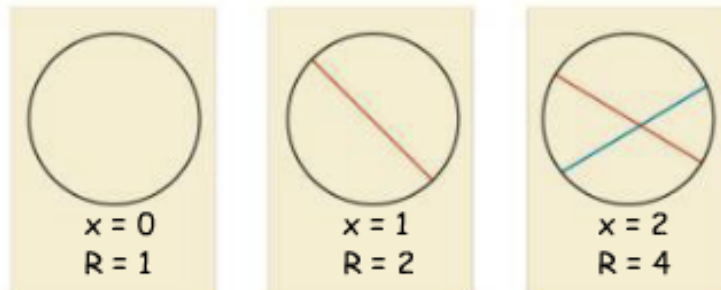
### Big Idea: Modeling

To model a data set, choose a function that most clearly matches the pattern in the data or graph.

#### Performance Task 3

*Solve. Show all your work and explain your steps.*

Suppose you draw chords to divide a circle into as many regions as possible. The maximum number of regions  $R$  you can make is a quadratic function of the number of chords  $x$  you draw. The values of  $R$  for  $x = 0$ ,  $x = 1$ , and  $x = 2$  are shown. What function models this situation? How many regions can you make with 10 chords?



**Performance Task Assessment: Analytic Holistic Scoring****Developing Autonomy—The student**

3	Persevered to complete the problem without help
2	Completed most of the problem without help
1	Needed key hints to complete the problem
0	Needed extensive guidance to work the problem

**The Solution Process—The student’s work showed**

3	A complete and appropriate solution process
2	An appropriate solution process that is almost complete
1	An appropriate process that is partially complete
0	An inappropriate process or no evidence of a process

**The Conclusion/Answer—The student’s answer is an**

3	Accurate conclusion, supported by valid evidence and reasons, appropriate to this problem and context
2	Inaccurate but logical conclusion, supported by evidence and reasoning but incorrect due to a minor factual error (in details of problem, in computation, recall a formula, etc.) or minor mistake in reasoning
1	Inaccurate but logical conclusion that overlooks, or gets wrong significant facts (about the problem, the rule, computation, etc.)
0	Inappropriate conclusion: not supported by facts and logic, or there is no conclusion

**Teacher Comments:**