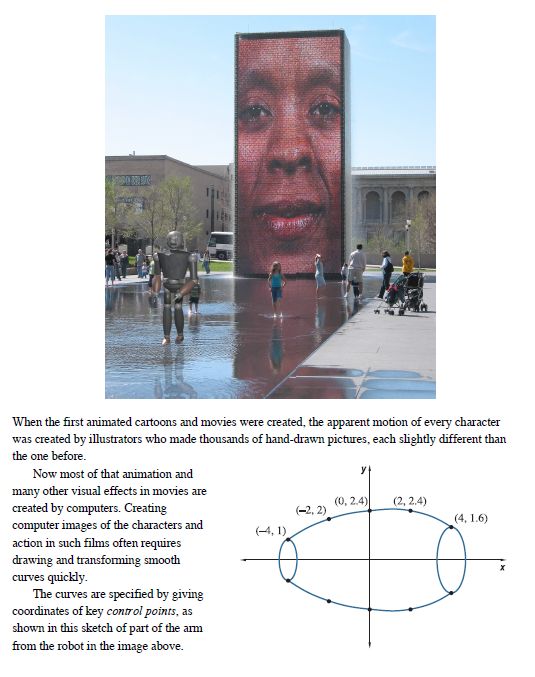
Math 4 Honors Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 2-4: *Constructing Polynomial Function Models* Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

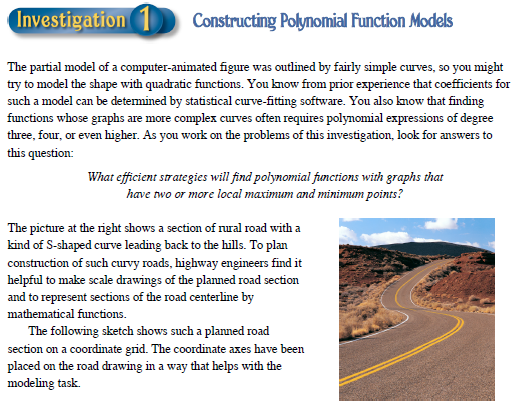
Learning Goal:

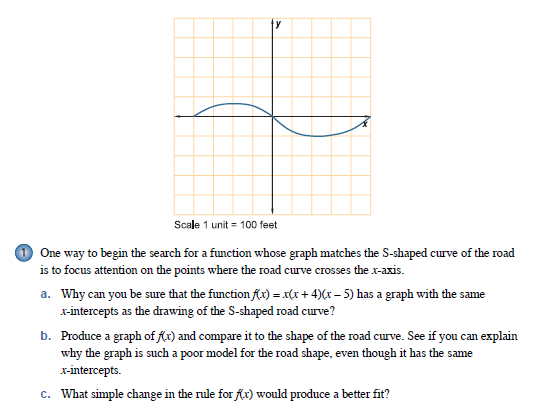
|  |
| --- |
| * *I can fit polynomial function models to data and graph patterns using problem conditions, statistical regression, and the method of undetermined coefficients (which is an application of matrices).* |



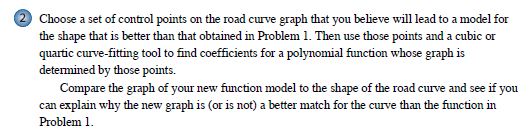
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Page 2





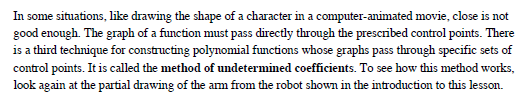
Page 3

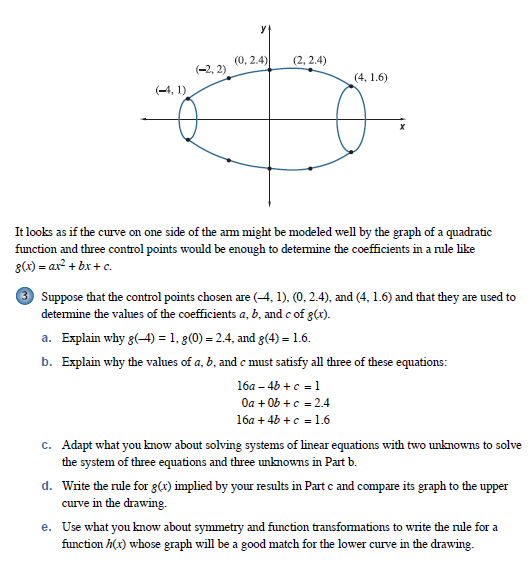


*You will need to use at least 4 control points. Enter your points into a spreadsheet on your calculator. Run a regression . . .*

The points give the equation

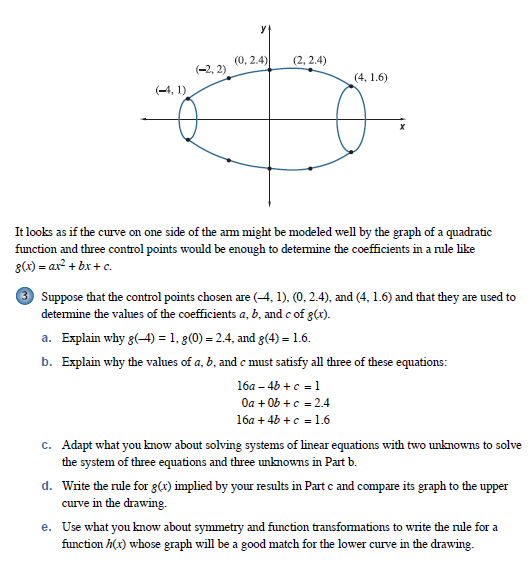
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Page 4

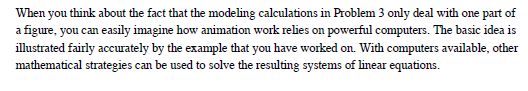


***Solve the system using substitution.***

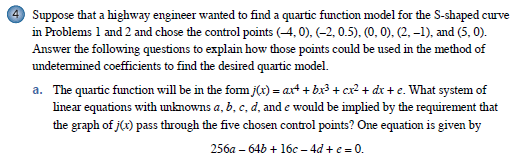
d. What would the matrix equation look like to solve the system in 3b? Solve the system using the

***inverse-matrix method*** to verify what you found in part c.

e.



Page 5



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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b. Translate the system from part a into a matrix equation. Write the matrix equation below.

c. Use the inverse-matrix method to solve the system. Write your solution matrix below.

d. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. If you had to use the method of undetermined coefficients to find the equation of a 5th degree polynomial, what would be the minimum number of control points you would need? \_\_\_\_\_\_\_\_\_

* How many equations would make up the system you would have to solve? \_\_\_\_\_\_\_\_\_
* What key points might you choose for your control points?

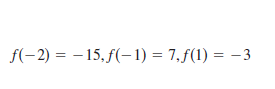
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**Lesson 2-4 Homework** Page 6

*Show all work on another sheet of paper.*

1. Use a system of equations to find the quadratic function that satisfies the quadratic function

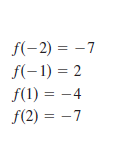
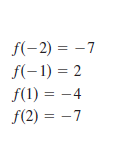
*f*(*x*) = *ax*2 + *bx* + *c* that satisfies the given equations. Use matrices to solve the system.



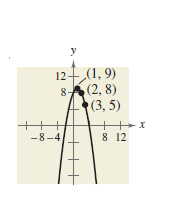
*f*(*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

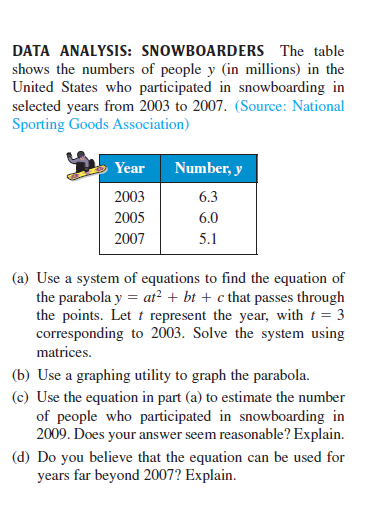
2. Use a system of equations to find the cubic function that satisfies the cubic function

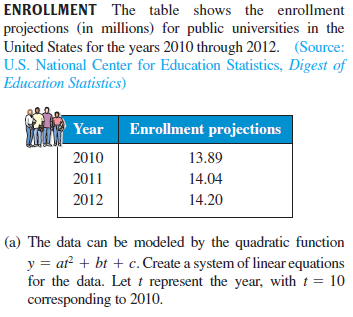
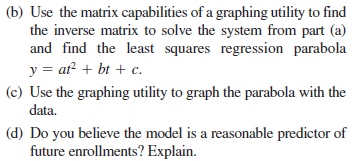
*f*(*x*) = *ax*3 + *bx*2 + *cx* + *d* that satisfies the given equations. Use matrices to solve the system.



*f*(*x*) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Use a system of equations to find the equation of the parabola *y*  = *ax*2 + *bx* + *c* that passes through the points. Use matrices to solve the system. Graph the equation in your calculator to verify your results.



4. 5.