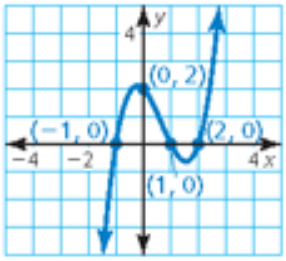
Name:_____ Date:_____ Band:_____
Algebra 2

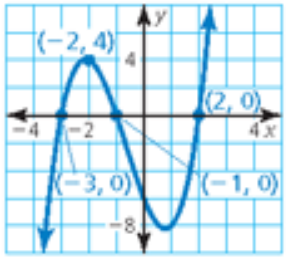
5.10 Modeling with Polynomial Functions Homework

Write a cubic function whose graph is shown.

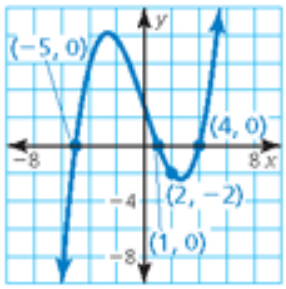
1.



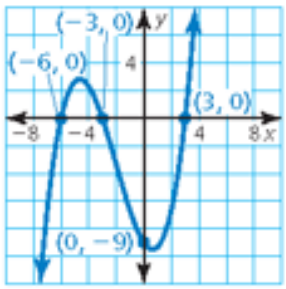
2.



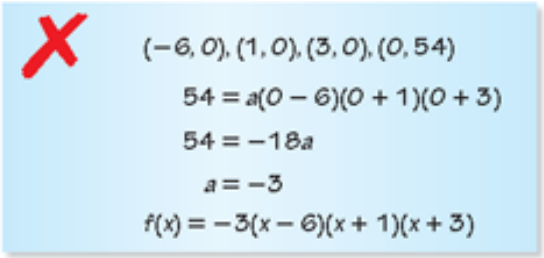
3.



4.

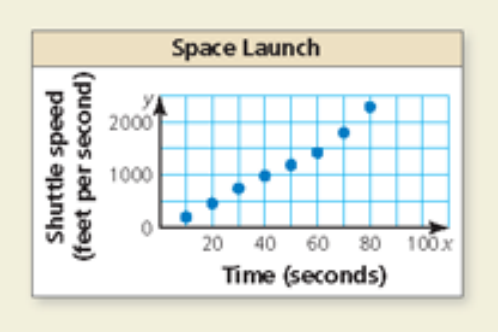


5. Describe and correct the error in writing a cubic function whose graph passes through the given points.



6. The dot patterns show pentagonal numbers. The number of dots in the nth pentagonal number is given by $f(n) = \frac{1}{2}n(3n - 1)$. Show that this function has constant second order differences.

7. The graph shows typical speeds y (in feet per second) of a space shuttle x seconds after it is launched.



A. What type of polynomial function models the data? Explain.

B. Which nth order finite difference should be constant for the function in part (a)? Explain.

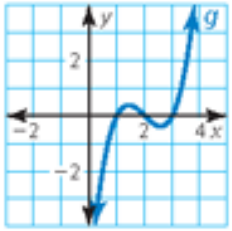
8. Your friend states that it is not possible to determine the degree of a function given the first-order differences. Is your friend correct? Explain your reasoning.

9. In class, our finite differences worked out "prettily" to find a model for the data set. In real-life, finite differences are a good tool to approximate what polynomial model best fits the data set, but even then finite differences do not always work out "prettily". Explain why you think you cannot always use finite differences to find a model for real-life data sets.

10. Order the polynomial functions according to their degree, from least to greatest.

A. $f(x) = -3x + 2x^2 + 1$

B.



C.

x	−2	−1	0	1	2	3
$h(x)$	8	6	4	2	0	−2

D.

x	−2	−1	0	1	2	3
$k(x)$	25	6	7	4	−3	10