

Chapter 15 Review

Name _____

No calculator #1- 9

1. Write the zeros of the function $y = (x - 5)(x^2 - x - 2)$
2. Sketch the graph of the function in Problem #1. Show where the zeros are and what shape the graph is.
3. Using the zeros in Problem #1, write the sum of the zeros, pair-wise products and the products of the zeros.
4. Write a cubic equation using the answers from #3 where the leading coefficient is 1.
5. Sketch the graph of a quartic function that has four real zeros and a positive y-intercept.

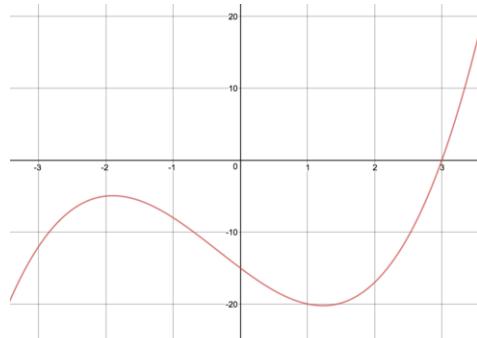
$$y = x^3 + x^2 - 7x - 15$$

6. Degree _____

#real zeros _____

#complex zeros _____

Sign of leading coefficient _____



7. Using Problem #6: use synthetic substitution to show $x = 3$ is a zero.
8. Using the answer to #7, write the function as a linear times a quadratic.
9. Using the answer to #8, find the other two complex zeros of the cubic function.

May use Calculator #10 – 24

10. Show that the data fits a cubic function by showing the 3rd differences are constant.

x	f(x)
2	19.4
3	40.1
4	74.2
5	123.5
6	189.8
7	274.9

11. Find the particular equation of the cubic function ALGEBRAICALLY.

12. Check your answer to #11 by running the cubic regression test on your calculator.

For #13-18: Stephanie drives through an intersection. At time $t = 2$ sec she crosses the stripe at the beginning of the intersection. She slows down a bit, but does not stop and then speeds up again. Stephanie is good at math, and she figures that her displacement, $d(t)$, in feet, from the first stripe is given by $d(t) = t^3 - 12t^2 + 54t - 68$

13. Use synthetic substitution to show that $t = 2$ is a zero of $d(t)$.

14. Use the results from #13 to find the other two zeros of $d(t)$.

15. How do the zeros in #14 confirm the fact that Stephanie does not stop and go back across the stripe?

16. Find the derivative of $d(t)$ using the short cut Power Rule.

17. Find $d'(3)$, which is Stephanie's instantaneous velocity at 3 seconds.

18. Find the equation of the line tangent at $t = 3$.

19. Using the derivative of $f(x) = x^3 - 2x^2 - 5x + 6$, find the x-coordinate of the extreme points of the graph $f(x)$.

For #20-24: $f(x) = \frac{2x-6}{x^2+2x-15}$

20. What is the real zero of $f(x)$?

21. Find any discontinuities of $f(x)$.

22. What kind of discontinuity are they?

23. Find the limit as x approaches each discontinuity.

24. Resolve $f(x)$ into partial fractions.