Algebra 3
Polynomials
Assessment Review

Name: _____

Date: _____ Period: ____

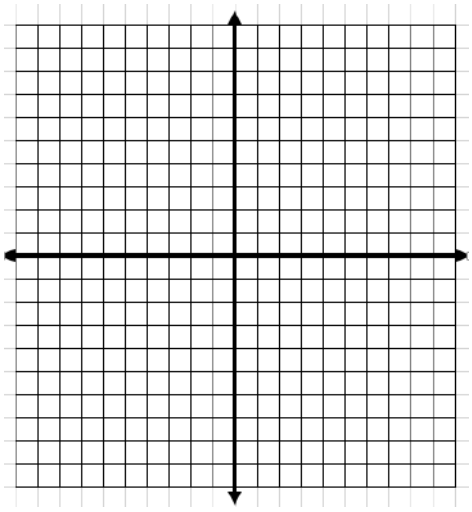
Standard: A-APR.B.3

1. Given the function $f(x) = x^3 - x^2 - 10x - 8$

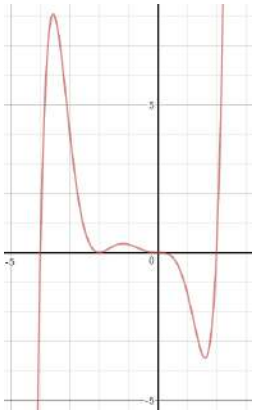
   A. Identify the zeroes of the function.

   B. Describe the end behavior of the function.

   C. Sketch the graph of the function.



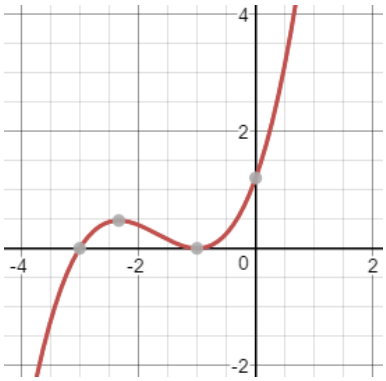
2. Use the graph of the 7th degree polynomial to determine the number of real and imaginary roots.



_____ real

_____ imaginary

3. Use the graph of the 5th degree polynomial to determine the number of real and imaginary roots.



_____ real

_____ imaginary

4. Is $(x-2)$ a factor of the function $f(x) = x^3 + 6x^2 - x - 30$? Explain.

5. Is $(x+1)$ a factor if the function $f(x) = x^4 + 3x^3 - 4x$? Explain.

6. Identify the zeroes of the function $f(x) = x^3 + 6x^2 - x - 30$, then write the function in factored form.

7. Identify the zeroes of the function $f(x) = x^4 + 3x^3 - 4x$, then write the function in factored form.

8. Find all the zeroes:

$f(x) = x^4 + x^3 - 2x^2 + 4x - 24$

9. Write a quadratic function in standard form given one of its zeroes is at $x = 2\sqrt{5}$.

Standard: A-REI.D.11

10. Use a graphing calculator to find the approximate intersection(s) to the nearest hundredth.

$f(x) = x^2 + 2x - 8$

$g(x) = x^3 + 3x^2 - 8$

11. A table of values is shown for two functions, *f*(*x*) and *g*(*x*). Use the table to identify the point(s) of intersection.

x	*f*(*x*)	*g*(*x*)
-3	95	-220
-2	20	-28
-1	-1	-4
0	-4	-4
1	-1	-4
2	20	20
3	95	212

12. Explain why a table may not be the best way to find the point(s) of intersection of two functions.

13. A retirement account contains cash and stock in a company. The functions shown below model the balance B (in thousands of dollars) over the past year. Time, t, is in weeks.

Using a graphing calculator, graph the models from t = 0 to t = 52, with a range of 0 to 20.

$B_c(t) = -0.12|t - 32| + 13$

$B_s(t) = 0.00005t^4 - 0.00485t^3 + 0.1395t^2 - 1.135t + 15.75$

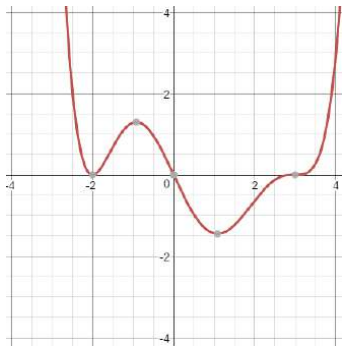
A. Find any points of intersection of the two functions.

B. Interpret the meaning of the intersections in the given context.

Standard: F-IF.B.4

14. Use the graph to identify the roots and their multiplicities.

Root	Multiplicity



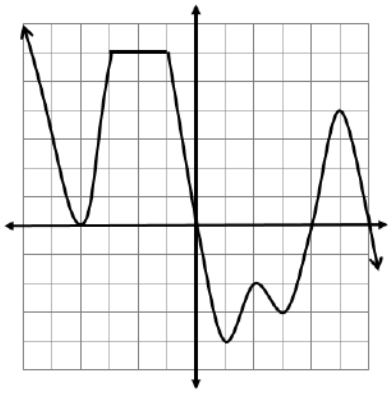
15. In your own words, describe the behavior of a graph at its roots when the roots have:

A. a multiplicity of 1.

B. a multiplicity of 2.

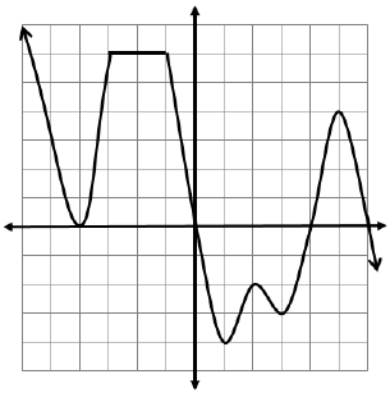
C. a multiplicity of 3.

16. Fill in the correct bubble to determine if the intervals on the graph shown below are increasing, decreasing or constant.



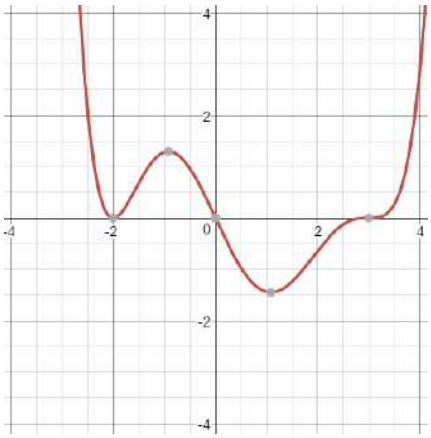
	Increasing	Decreasing	Constant
$x < -4$	○	○	○
$-3 < x < -2$	○	○	○
$3 < x < 5$	○	○	○
$x > 5$	○	○	○

17. Fill in the correct bubble to determine if the intervals on the graph shown below are positive or negative.



	Positive	Negative
$x < 0$	○	○
$0 < x < 4$	○	○
$4 < x < 6$	○	○
$x > 6$	○	○

Use the graph below for numbers 18-19.



18. Identify a local maximum and local minimum.

19. Identify an absolute minimum.

Standard: F.IF.C.9

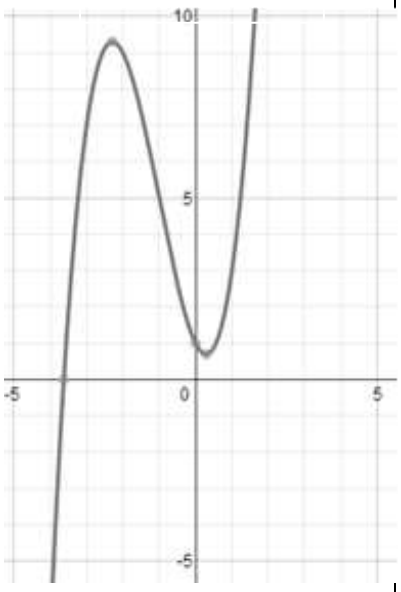
20. How will the graph of the function $y = (2x+5)^3$ transform when changed to $y = (2x+5)^3 + 4$?

21. How will the graph of the function $y = (2x+5)^3$ transform when changed to $y = -(2x+5)^3$?

22. Compare the functions below and calculate the requested information. Complete the middle column by comparing the solutions for f(x) and g(x) in each row using <, >, or =.

$f(x) = 3x^2 - 2x - 5$

Graph of g(x)



f(x)	**<, >, =**	***g*(x)**
Number of real x-intercepts**:** ___		Number of real x-intercepts**:** ___
Smallest x-intercept**:** ___		Smallest x-intercept**:** ___
Minimum on the interval [0, 2] **:** ___		Minimum on the interval [0, 2] **:** ___
Rate of change over [-1, 1] **:** ___		Rate of change over [-1, 1] **:** ___

B. How do the end behaviors of $f(x)$ and $g(x)$ compare as x approaches infinity?

C. Which equation has a smaller local minimum? How do you know?

23. Use your graphing utility to examine the functions below:

$f(x) = x^3 + x^2 - 4x - 1$

$g(x) = -x^2 - 2x + 3$

A. Complete the chart.

	f(x)	**g(x)**
Number of real x-intercepts		
Smallest x-intercept		
Minimum on the interval [2, 5]		
Rate of change over the interval [3,5]		

B. Bubble in the correct function.

	f(x)	**g(x)**
The function with the greater number of real x-intercepts.	○	○
The function with the smallest x-intercept.	○	○
The function with the greater minimum on the interval [2, 5].	○	○
The function with a negative rate of change over the interval [3,5].	○	○

C. State the end behavior of f(x) and g(x) as $x \to \infty$.

As $x \to \infty$ then $f(x) \to$ _____

As $x \to \infty$ then $g(x) \to$ _____