Name_____ Date_____ Period_____

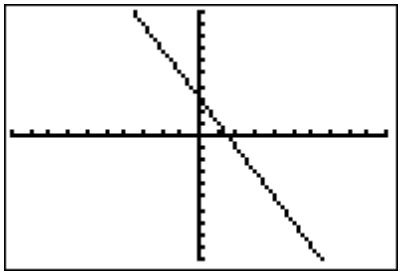
ANALYZING POLYNOMIAL FUNCTIONS WORKSHEET

Fill in the blanks.

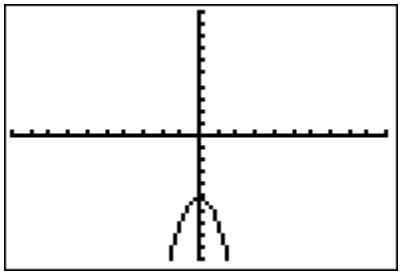
1. The graphs of polynomial functions are _____, which means that the domain of the function is a single interval with no breaks.
2. The _____ _____ _____ is used to determine the end behavior of the graph of a polynomial function.
3. A polynomial function is written in _____ _____ if its terms are written in descending order of exponents from left to right.
4. It is possible for an _____ degree polynomial to have no real zeros.
5. An _____ degree polynomial must have at least one real zero.

Match the polynomial function with its graph WITHOUT using a graphing calculator.

A.



B.



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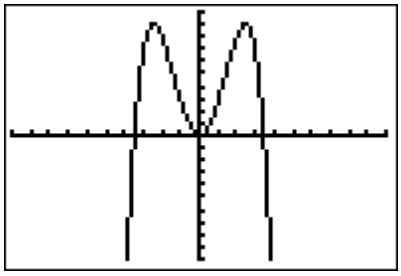
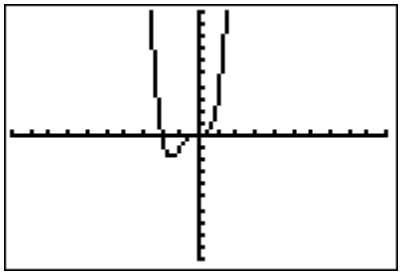
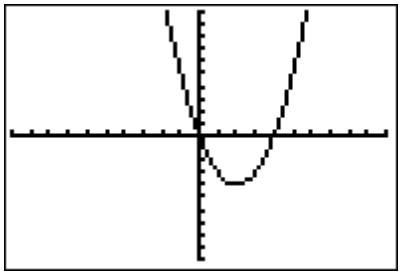


D.



E.



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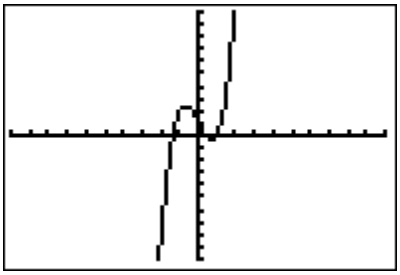
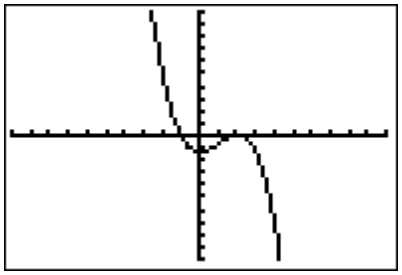
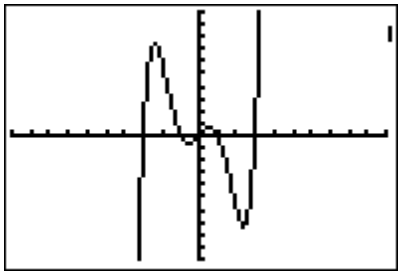


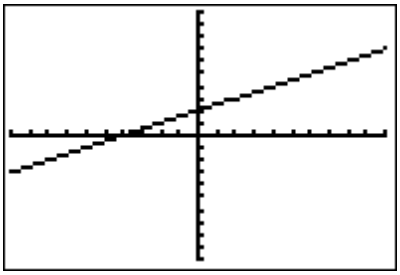
G.



H.



I.



_____ 6. $f(x) = x^2 - 4x$ _____ 7. $f(x) = \frac{1}{2}x + 2$ _____ 8. $f(x) = -2x + 3$

_____ 9. $f(x) = 2x^3 - 3x + 1$ _____ 10. $f(x) = -2x^2 - 5$ _____ 11. $f(x) = x^4 + 2x^3$

_____ 12. $f(x) = -\frac{1}{3}x^3 + x^2 - \frac{4}{3}$ _____ 13. $f(x) = -\frac{1}{4}x^4 + 3x^2$ _____ 14. $f(x) = \frac{1}{5}x^5 - 2x^3 + \frac{9}{5}x$

Describe the end behavior of the graph of the polynomial function WITHOUT graphing.

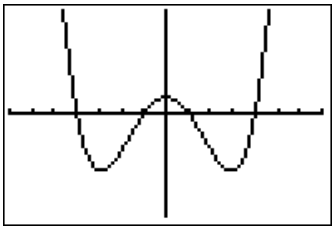
15. $f(x) = 4x - 2 + 5x^5$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____	16. $f(x) = -5x^3$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____	17. $f(x) = -12x^6 - 2x + 5$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____
18. $f(x) = 6 - 2x + 4x^2 - 5x^3$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____	19. $f(x) = 1 + 3x^4 - x^2$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____	20. $f(x) = 2x^5 - 7x^2 - 4x$ as $x \to -\infty$, $y \to$_____ and as $x \to +\infty$, $y \to$ _____

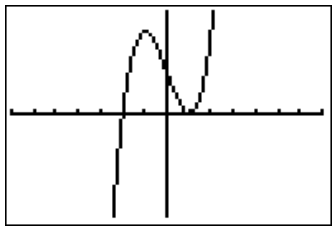
Complete the statement to make it true.

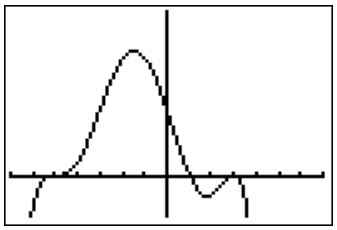
21. $f(x) = (x-1)^2(x-6)^3(x+4)$ is a degree _____ polynomial with a _____ leading coefficient. the graph will _____ at the zero of x = _____, _____ at the zero of x = _____, and _____ at the zero of x = _____.

22. A polynomial with a real zero with multiplicity four and two imaginary zeros must be a degree _____ polynomial.

Write a factored form polynomial function *f(x)* of least degree that has a leading coefficient of 1 with the real zeros shown in the graph.

23. 

24. 

25. 

WITHOUT a calculator, sketch the graph of each polynomial functions using the info provided.

26. A polynomial with a negative leading coefficient and zeros of $x = -3$ (mult. 2) and $x = 1$.

27. A polynomial with a positive leading coefficient and zeros of $x = -2$ (mult. 3), $x = 0$, and $x = 3$ (mult. 2)