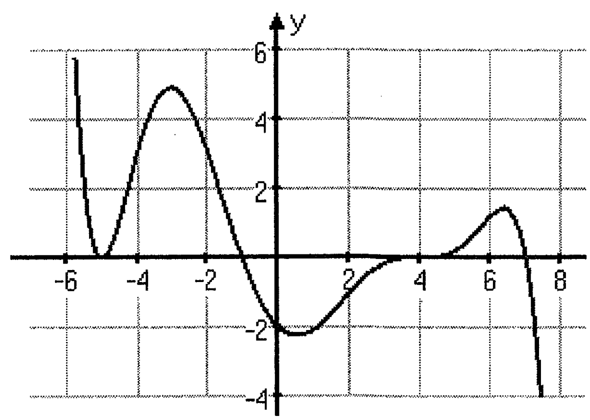
Polynomials Review

Vocabulary Check:

1. If 6 is a "zero" of the function f, then f(6) = 0.
2. If -2 is a "solution" to the equation g(x) = 0, then g(-2) = 0.
3. If 3 is a "zero" of the polynomial f(x), the (x – 3) is called a "factor" of f(x).
4. If f(8) = 0, then (8, 0) is an x-intercept of the graph of function f.
5. If (x + 3) is a "factor" of the polynomial h(x), then x = -3 is a "zero" or "solution" of function h.
6. If 2 is an "x-intercept" of the graph of polynomial f(x), then (x - 2) is a "factor" of function f.
7. If x – 6 is a "factor" if the polynomial g(x), then g(6) = 0.

Questions about the Graph of the Polynomial:

8. If an extrema lies on the x-axis, then it is a zero of the function and its multiplicity is 2.
9. All polynomial functions have exactly one x-intercept. TRUE or FALSE? FALSE
10. All polynomial functions have exactly one y-intercept. TRUE or FALSE? TRUE
11. The y-intercept of the graph is the constant of the equation.
12. To factor a polynomial from its graph, write the additive inverses of the x-intercepts in binomial factors.



13. The graph at right has zeros at x = -5, x = -1, x = 4, and x = 7.
14. There is a multiplicity of 2 at x = -5 and a multiplicity of 3 at x = 4.
15. The leading coefficient of the graph must be negative because the graph is decreasing from left to right.
16. A factored form of the graph could be $(x+5)^2(x+1)(x-4)^3(x-7)$.

Other Questions:

17. The degree of the polynomial $x^3 - 5x^2 + 4x - 6$ is 3.
18. A polynomial of degree 5 has how many total solutions? 5
19. If the solution set of a polynomial function is $\{5, 3i, -3i\}$, then the graph intersects the x-axis at (5, 0).

20. Using the Remainder Theorem, if the polynomial f(x) is divided by (x + 7), and the remainder is 5, then f(-7) = 5.

21. Using the Remainder Theorem, if the polynomial g(x) is divided by (x – 3) and the remainder is 0, then g(3) = 0. Also, (x – 3) is a factor of g(x).

22. Using the Rational Zero Theorem, explain how you know that $\frac{2}{5}$ cannot be a solution to the equation $7x^3 + 4x^2 - x - 6 = 0$.

the factors of the LC are 1 and 7; these are the only values possible for denominator

23. Using the Rational Zero Theorem, list all possible rational solutions to $3x^4 - x^2 = 8x - 4$.

24. Given a polynomial has zeros at 3, 4i and $\sqrt{2}$, what is the *least possible degree* of the function? EXPLAIN. There must also be solutions $-4i$ and $-\sqrt{2}$ therefore the degree is at least 5

25. If we are given that 5 + 6i is a solution to polynomial, we know that 5 - 6i must also be a solution.

26. If we are given that $-4-\sqrt{7}$ is a solution to a polynomial, we know that $-4+7i$ must also be a solution.

27. To one decimal place, approximate where we would locate the x-intercepts of a function with zeros at $x = \frac{-5 \pm \sqrt{41}}{8}$: .2 and -1.4.

$\sqrt{41} \approx 6.4$

#23 Rewrite in standard form

$3x^4 - x^2 = 8x - 4$

$3x^4 - x^2 - 8x + 4 = 0$

$P/q = \pm \frac{1, 2, 4}{1, 3} \rightarrow \pm \{1, \frac{1}{3}, 2, \frac{2}{3}, 4, \frac{4}{3}$

$2\frac{1}{4}$ 1000

.93 $2\frac{1}{4}$% /1000