Name: _____ **Class:** _____ **Date:** _____

ALGEBRA 2 HONORS--UNIT 9 (6.1 TO 6.6) PRACTICE TEST. GLUE IN AND SHOW ALL WORK AND EXPLAIN IN WORDS HOW TO DO EACH PROBLEM AND GET AN EXTRA CREDIT STAMP IN YOU NOTEBOOK.

1. Classify $-7x^5 - 6x^4 + 4x^3$ by degree and by number of terms.
2. Use a graphing calculator to determine which type of model best fits the values in the table.

x	–6	–2	0	2	6
y	–6	–2	0	2	6

3. Write $4x^3 + 8x^2 - 96x$ in factored form.
4. Use a graphing calculator to find the relative minimum, relative maximum, and zeros of $y = 3x^3 + 15x^2 - 12x - 60$. If necessary, round to the nearest hundredth.
5. Find the zeros of $y = x(x - 3)(x - 2)$. Then graph the equation.
6. Write a polynomial function in standard form with zeros at 5, –4, and 1.
7. Find the zeros of $f(x) = (x + 3)^2(x - 5)^6$ and state the multiplicity.
8. Divide $3x^3 - 3x^2 - 4x + 3$ by $x + 3$.

Divide using synthetic division.

9. $(x^4 + 15x^3 - 77x^2 + 13x - 36) \div (x - 4)$
10. $(x^3 + 4 - 11x + 3x^2) \div (x + 6)$
11. Use synthetic division to find $P(2)$ for $P(x) = x^4 + 3x^3 - 6x^2 - 10x + 8$.

Solve the equation by graphing.

12. $x^2 + 7x + 19 = 0$
13. $-8x^3 - 13x^2 + 6x = 0$

Factor the expression.

14. $x^3 + 216$
15. $x^4 - 20x^2 + 64$
16. Solve $125x^3 + 343 = 0$. Find all complex roots.
17. Solve $x^4 - 34x^2 = -225$.
18. Find the rational roots of $x^4 + 8x^3 + 7x^2 - 40x - 60 = 0$.

Find the roots of the polynomial equation.

19. $x^3 - 2x^2 + 10x + 136 = 0$
20. $2x^3 + 2x^2 - 19x + 20 = 0$
21. $x^4 - 5x^3 + 11x^2 - 25x + 30 = 0$
22. A polynomial equation with rational coefficients has the roots $5 + \sqrt{1}, 4 - \sqrt{7}$. Find two additional roots.
23. Find a third-degree polynomial equation with rational coefficients that has roots –5 and $6 + i$.
24. Find a quadratic equation with roots $-1 + 4i$ and $-1 - 4i$.
25. Find all zeros of $2x^4 - 5x^3 + 53x^2 - 125x + 75 = 0$.

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Answer Section

SHORT ANSWER

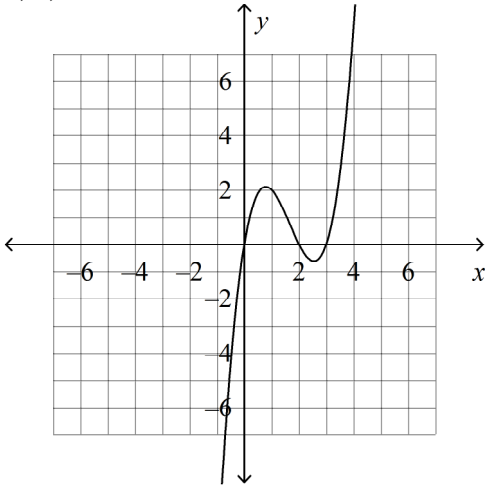
1. ANS:
   quintic trinomial

   REF: 6-1 Polynomial Functions
2. ANS:
   linear model

   REF: 6-1 Polynomial Functions
3. ANS:
   $4x(x - 4)(x + 6)$

   REF: 6-2 Polynomials and Linear Factors
4. ANS:
   relative minimum: –62.24, relative maximum: 37.79,
   zeros: $x = –5, –2, 2$

   REF: 6-2 Polynomials and Linear Factors
5. ANS:
   0, 3, 2



   REF: 6-2 Polynomials and Linear Factors
6. ANS:
   $f(x) = x^3 - 2x^2 - 19x + 20$

   REF: 6-2 Polynomials and Linear Factors

7. ANS:
–3, multiplicity 2; 5, multiplicity 6

REF: 6-2 Polynomials and Linear Factors

8. ANS:
$3x^2 - 12x + 32 + -93/(x+3)$

REF: 6-3 Dividing Polynomials

9. ANS:
$x^3 + 19x^2 - x + 9$

REF: 6-3 Dividing Polynomials

10. ANS:
$x^2 - 3x + 7 - 38/(x+6)$

REF: 6-3 Dividing Polynomials

11. ANS:
4

REF: 6-3 Dividing Polynomials

12. ANS:
no solution

REF: 6-4 Solving Polynomial Equations

13. ANS:
0, –2, 0.38

REF: 6-4 Solving Polynomial Equations

14. ANS:
$(x + 6)(x^2 - 6x + 36)$

REF: 6-4 Solving Polynomial Equations

15. ANS:
$(x - 2)(x + 2)(x - 4)(x + 4)$

REF: 6-4 Solving Polynomial Equations

16. ANS:
$-\frac{7}{5}, \frac{35}{50} - \frac{35i\sqrt{3}}{50}, \frac{35}{50} + \frac{35i\sqrt{3}}{50}$

REF: 6-4 Solving Polynomial Equations

17. ANS:
3, –3, 5, –5

REF: 6-4 Solving Polynomial Equations

18. ANS:
–6, –2

REF: 6-5 Theorems About Roots of Polynomial Equations

19. ANS:
3-5*i*,3+5*i*, –4

REF: 6-5 Theorems About Roots of Polynomial Equations

20. ANS:
$\frac{3 + i}{2}, \frac{3 - i}{2}, -4$

REF: 6-5 Theorems About Roots of Polynomial Equations

21. ANS:
$2, 3, i\sqrt{5}, -i\sqrt{5}$

REF: 6-5 Theorems About Roots of Polynomial Equations

22. ANS:
$5 - \sqrt{1}, 4 + \sqrt{7}$

REF: 6-5 Theorems About Roots of Polynomial Equations

23. ANS:
$x^3 - 7x^2 - 23x + 185 = 0$

REF: 6-5 Theorems About Roots of Polynomial Equations

24. ANS:
$x^2 + 2x + 17 = 0$

REF: 6-5 Theorems About Roots of Polynomial Equations

25. ANS:
$1, \frac{3}{2}, 5i, -5i$

REF: 6-6 The Fundamental Theorem of Algebra