

Name _____ Date _____ Period _____

A) Write a polynomial function of minimum degree in factored form with real coefficients whose zeros include those listed.

B) Find the degree of the polynomial (# of zeros).

C) Identify the x-intercepts.

Show work!

1. 2, 3, and i

2. -2 , and $1 + 2i$

3. $\pm\sqrt{3}$, -4 , and $5 - 6i$

A) Write a polynomial function of minimum degree in standard form with real coefficients whose zeros include those listed.

B) Find the degree of the polynomial (# of zeros).

C) Identify the x-intercepts.

Show work!

4. $x = 2$ and $3i$

5. $x = 0$ and $2 - 5i$

A) Write a polynomial function of minimum degree in factored form with real coefficients using the following information.

B) Find the degree of the polynomial (# of zeros).

C) Identify the x-intercepts.

Show work!

6. 1 (multiplicity 2), -2 (multiplicity 3)

7. leading coefficient of -2 , $x = 2i$ (multiplicity 1) and $x = -6$ (multiplicity 3)

8. leading coefficient of 2, $x = 5i$ (multiplicity 1), $2 + 4i$ (multiplicity 1) and $x = -8$ (multiplicity 2)

A) Write a polynomial function of minimum degree in standard form with real coefficients whose zeros and their multiplicities include those listed.

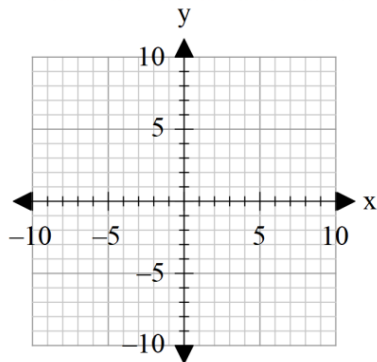
B) Find the degree of the polynomial.

C) Find the x-intercept(s).

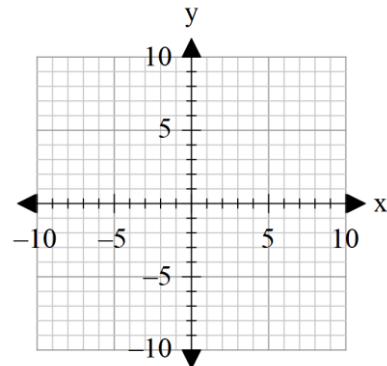
D) Sketch the graph.

Show work!

9. leading coefficient: -1
 $x = 0$ (multiplicity 2),
 $x = 3$ (multiplicity 2)



10. leading coefficient: -2
 $x = 4, x = 1 + i$



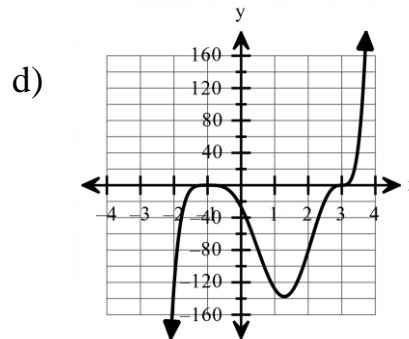
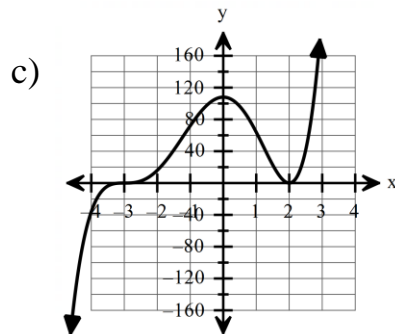
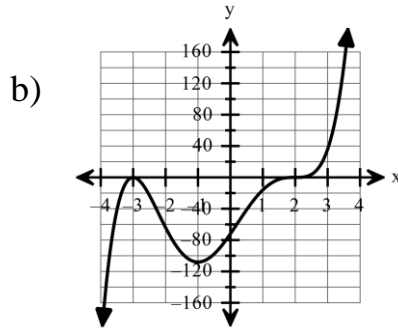
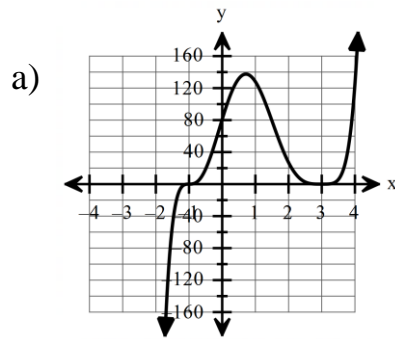
Match the polynomial function graph to the given zeros and multiplicities.

11. -3 (multiplicity 2), 2 (multiplicity 3)

12. -3 (multiplicity 3), 2 (multiplicity 2)

13. -1 (multiplicity 4), 3 (multiplicity 3)

14. -1 (multiplicity 3), 3 (multiplicity 4)



Using the given zero, find all the remaining zeros of each polynomial. Write the function in factored form. Show work!

15. $-i$ is a zero of $f(x) = x^4 - x^3 - 5x^2 - x - 6$

16. $4i$ is a zero of $f(x) = x^4 + 13x^2 - 48$

17. $3 - 2i$ is a zero of $f(x) = x^4 - 6x^3 + 11x^2 + 12x - 26$

Find all complex zeros of each polynomial. Write the function in factored form. Show work!

18. $f(x) = x^4 + 3x^3 + 4x^2 - 8$

19. $f(x) = -2x^3 + 3x^2 + 4x - 6$

Write the function as a product of linear and irreducible quadratic factors all with real coefficients. Show work! (Irreducible quadratic means the x^2 term doesn't factor or the quadratic formula does not give an imaginary number answer.)

20. $f(x) = 2x^3 - x^2 + 2x - 3$

21. $f(x) = x^4 - 2x^3 + x^2 - 8x - 12$

Find the unique polynomial with real coefficients that meets these conditions.

22. Degree 4; zeros at $x = 1 - 2i$ and $x = 1 + i$; $f(0) = 20$