Date Completed: _____
Mentor Initials: _____

Non-Quadratic Polynomials

Multiple Choice

1. The function $y = f(x)$ is graphed in the xy-plane and crosses the x-axis at 4 distinct points. Which of the following could define the function f?

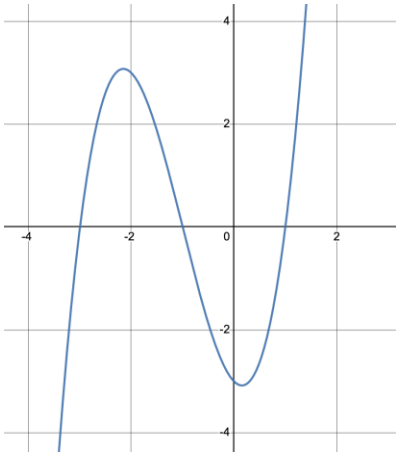
A) $f(x) = x^4$
B) $f(x) = (x-4)^2(x+4)^2$
C) $f(x) = (x-2)(x+2)(x+4)^2$
D) $f(x) = x(x-2)(x+2)(x+4)$

2. $f(x) = a(x+b)(x+c)(x+d)$

For the cubic function f shown, a, b, c, and d are constants. Which of the following is the value of $f(0)$?

A) 0
B) a
C) bcd
D) $abcd$

3.



The graph of the function above is shown in the xy-plane. Which of the following could define f?

A) $f(x) = -(x+3)(x+1)(x-1)$
B) $f(x) = -(x-3)(x+1)(x-1)$
C) $f(x) = (x-3)(x+1)(x-1)$
D) $f(x) = (x+3)(x+1)(x-1)$

4. $y = -(x-2)(x-3)(x-4)$

If the given function h is graphed in the xy-plane, where $y = h(x)$, which of the following is an x-intercept of the graph?

A) $(-24, 0)$
B) $(-4, \ 0)$
C) $(\ 4, \ 0)$
D) $(24, \ 0)$

5. $y = -(x-2)(x-1)(x+1)$

The graph in the xy-plane of the equation above contains the point (a, b). If $-1 \leq a \leq 1$, which of the following is NOT a possible value of b?

A) -2
B) -1
C) $\ 0$
D) $\ 1$

Grid-In

6. $f(x) = x^3 + 4x^2 - 5x - 2$

For the function f defined above, what is the value of $f(-1)$?

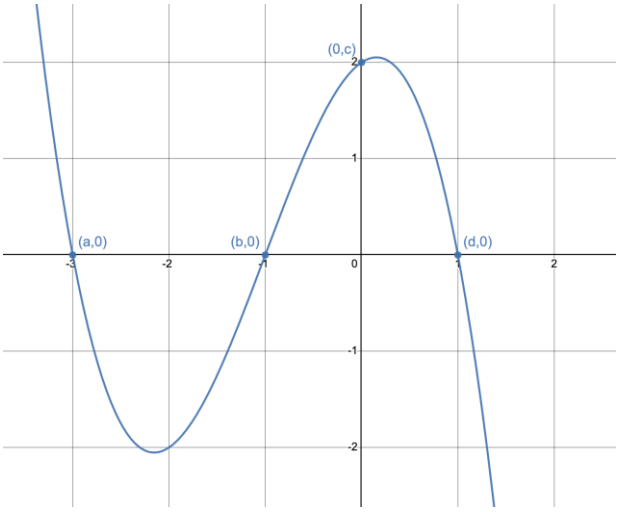
7. $(x-3) = (x-4)(x-3)$

What is the sum of the solutions to the given equation?

8. $x(x-8)(x+4)(x+9)^2 = 0$

What is the largest value of x that satisfies the given equation?

9.



The graph of the cubic polynomial function f is shown in the xy=plane, where $y = f(x)$ and a, b, c, and d are constants. When $f(x) = 0$, the value of x is an integer. What is the absolute value of the smallest value of x such that $f(x) = 0$?

10. $f(x) = x^3 + ax^2 + bx + c$

The function f is defined above, where a, b, and c are integer constants. If the zeros of the function are $-7,\ 2$, and 3, what is the value of c?

11. $x(x-8)(x+4)(x+9)^2 = 0$

If k is the smallest is the value of x that satisfies the given equation, what is the value of $|k|$?

12. $x^2(x+4)(x-c) = 0$

In the given equation, c is a positive constant. The sum of the solutions of the equation is 6. What is the value of c?

13. In the xy-plane, at how many points does the graph of $f(x) = (x - 6)(x + 2)(x + 5)$ intersect the x-axis?

14. $3(x + 6) = (x - 2)(x + 6)$

What positive value of x satisfies the given equation?

15. $f(x) = x^3 + ax^2 + bx + c$

In the xy-plane, the graph of the cubic equation $y = x^3 + ax^2 + bx + c$ where $a, b,$ and c are constants, has x-intercepts at $x = -3$, $x = -5$, and $x = -6$. What is the value of a ?