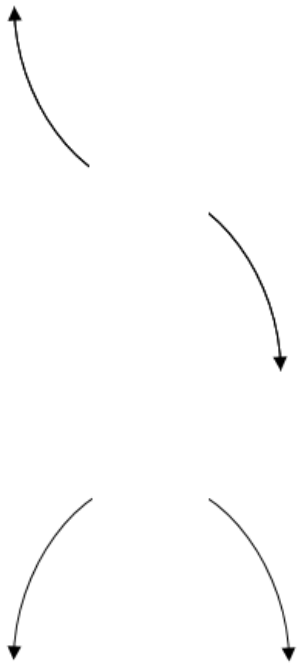
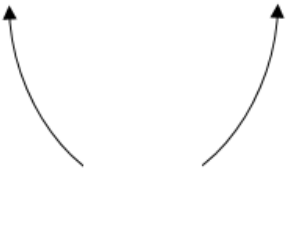
1. Describe the end behavior of the polynomial below.

$$f(x) = -9(x+4)^3(x-4)^6(x+5)^2(x-5)^3$$

A.

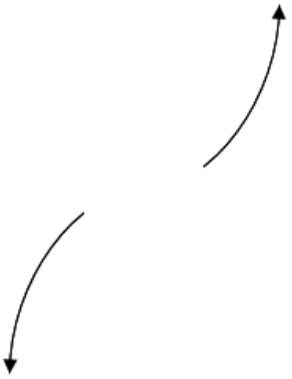


C.



B.

D.



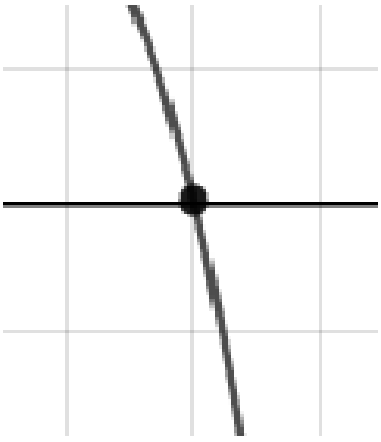
E. None of the above.

---

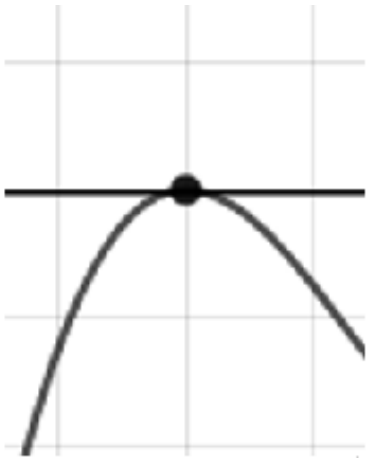
2. Describe the zero behavior of the zero $x = 2$ of the polynomial below.

$$f(x) = 9(x+4)^6(x-4)^4(x-2)^9(x+2)^6$$

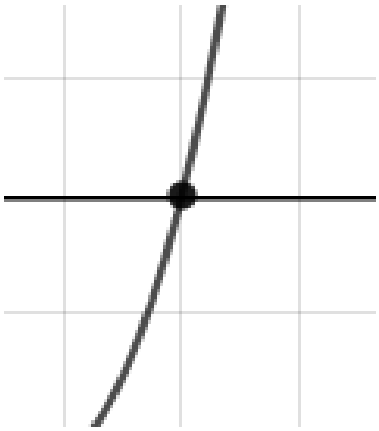
A.



B.



C. 

D. 

E. None of the above.

---

3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-5 - 4i \text{ and } 2$$

A. $b \in [7, 11], c \in [16.6, 24.7],$ and $d \in [-82.5, -81]$

B. $b \in [0, 5], c \in [1.6, 2.3],$ and $d \in [-9.2, -7.7]$

C. $b \in [0, 5], c \in [2.8, 4.4],$ and $d \in [-11.9, -8.9]$

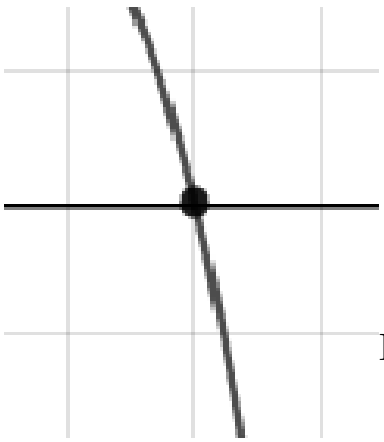
D. $b \in [-10, -4], c \in [16.6, 24.7],$ and $d \in [78.5, 82.4]$

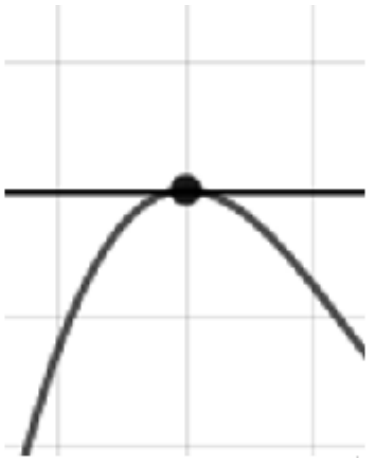
E. None of the above.

---

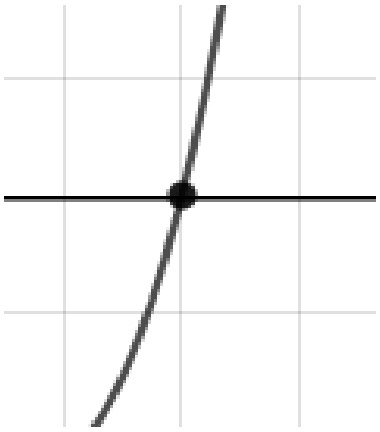
4. Describe the zero behavior of the zero $x = -6$ of the polynomial below.

$$f(x) = -7(x+6)^8(x-6)^9(x-3)^6(x+3)^9$$

A. 

B. 

C. 

D. 

E. None of the above.

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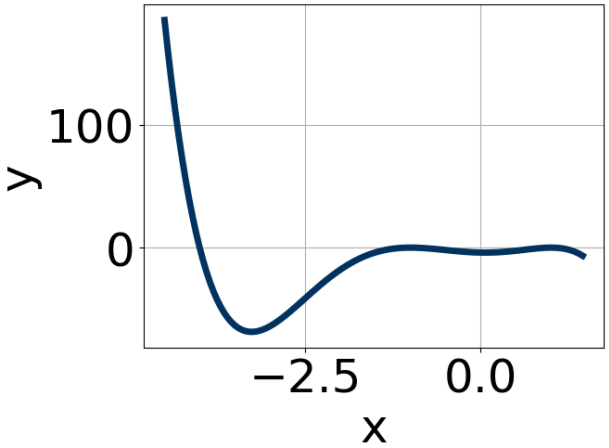
5. Which of the following equations *could* be of the graph presented below?



A. $6(x+1)^{10}(x-1)^{6}(x+4)^{6}$

B. $-6(x+1)^4(x-1)^5(x+4)^8$

C. $-9(x+1)^{10}(x-1)^9(x+4)^{11}$

D. $-7(x+1)^6(x-1)^6(x+4)^9$

E. $15(x+1)^8(x-1)^4(x+4)^5$

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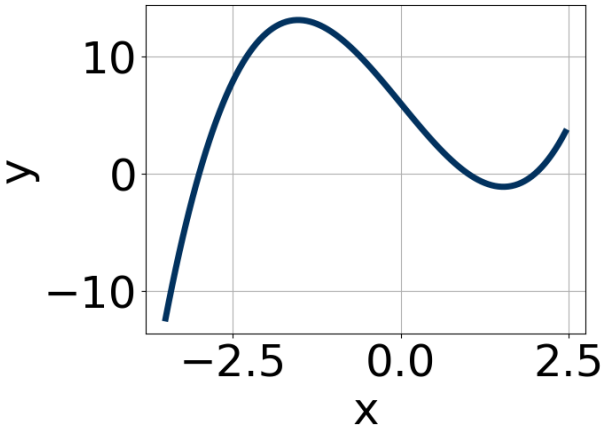
6. Which of the following equations *could* be of the graph presented below?



A. $-3(x-2)^9(x+3)^{11}(x-1)^9$

B. $17(x-2)^{10}(x+3)^7(x-1)^7$

C. $-18(x-2)^8(x+3)^9(x-1)^5$

D. $20(x-2)^4(x+3)^{10}(x-1)^9$

E. $6(x-2)^9(x+3)^9(x-1)^7$

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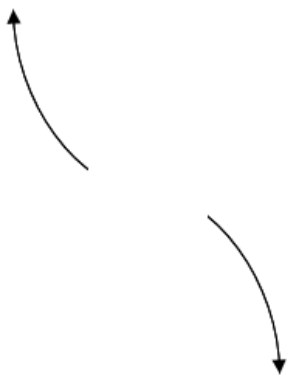
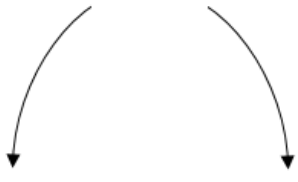
7. Describe the end behavior of the polynomial below.

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

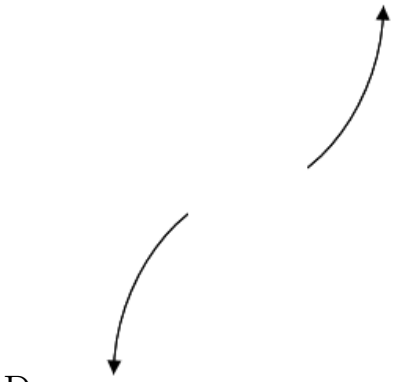


A.

B.



D.



C.

E. None of the above.

---

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{6}{5}, \frac{4}{5}, \text{ and } \frac{-5}{2}$$

A. $a \in [50, 56], b \in [225, 228], c \in [298, 302],$ and $d \in [113, 124]$

B. $a \in [50, 56], b \in [15, 26], c \in [-203, -196],$ and $d \in [113, 124]$

C. $a \in [50, 56], b \in [140, 148], c \in [0, 13],$ and $d \in [-125, -119]$

D. $a \in [50, 56], b \in [15, 26], c \in [-203, -196],$ and $d \in [-125, -119]$

E. $a \in [50, 56], b \in [-26, -18], c \in [-203, -196],$ and $d \in [-125, -119]$

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9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-5 + 5i \text{ and } -1$$

A. $b \in [-12, -5], c \in [60, 64],$ and $d \in [-51, -40]$

B. $b \in [7, 18], c \in [60, 64],$ and $d \in [48, 53]$

C. $b \in [-3, 9], c \in [0, 11],$ and $d \in [2, 15]$

D. $b \in [-3, 9], c \in [-6, -2],$ and $d \in [-5, -2]$

E. None of the above.

---

10. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-6}{5}, \frac{-1}{2}, \text{ and } \frac{4}{5}$$

A. $a \in [40, 53], b \in [43, 50], c \in [-38, -36],$ and $d \in [20, 26]$

B. $a \in [40, 53], b \in [-133, -118], c \in [93, 99],$ and $d \in [-28, -21]$

C. $a \in [40, 53], b \in [-78, -71], c \in [-6, 0],$ and $d \in [20, 26]$

D. $a \in [40, 53], b \in [-54, -41], c \in [-38, -36],$ and $d \in [20, 26]$

E. $a \in [40, 53], b \in [43, 50], c \in [-38, -36],$ and $d \in [-28, -21]$
