

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

$$\frac{1}{3}, 7, \text{ and } \frac{5}{3}$$

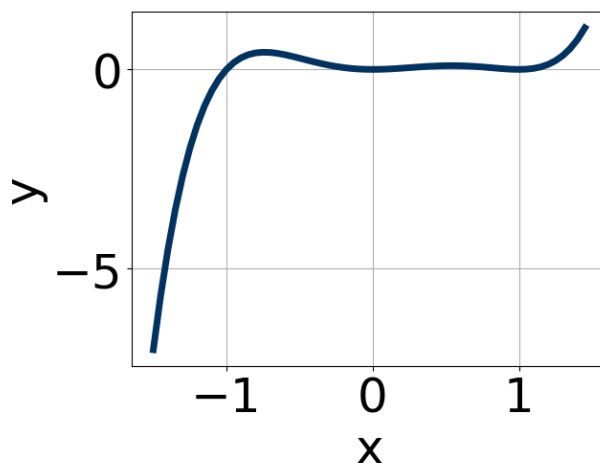
- A. $a \in [2, 13], b \in [-83, -77], c \in [129, 133], \text{ and } d \in [-38, -33]$
- B. $a \in [2, 13], b \in [-83, -77], c \in [129, 133], \text{ and } d \in [35, 38]$
- C. $a \in [2, 13], b \in [79, 93], c \in [129, 133], \text{ and } d \in [35, 38]$
- D. $a \in [2, 13], b \in [-77, -74], c \in [79, 80], \text{ and } d \in [35, 38]$
- E. $a \in [2, 13], b \in [51, 52], c \in [-90, -84], \text{ and } d \in [-38, -33]$

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

$$4 - 5i \text{ and } 1$$

- A. $b \in [1, 3], c \in [-11, -4], \text{ and } d \in [2, 9]$
- B. $b \in [5, 20], c \in [49, 51], \text{ and } d \in [38, 46]$
- C. $b \in [1, 3], c \in [0, 9], \text{ and } d \in [-11, 2]$
- D. $b \in [-17, -5], c \in [49, 51], \text{ and } d \in [-44, -38]$
- E. None of the above.

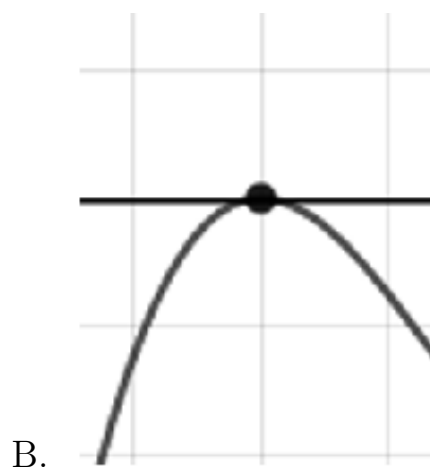
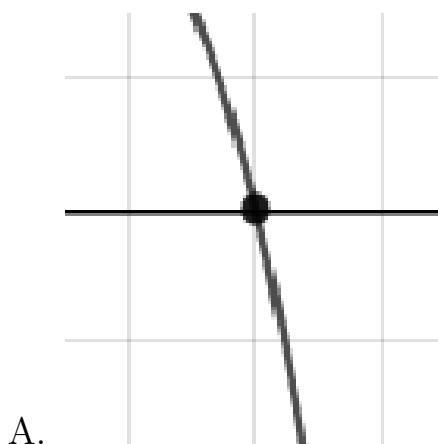
3. Which of the following equations *could* be of the graph presented below?

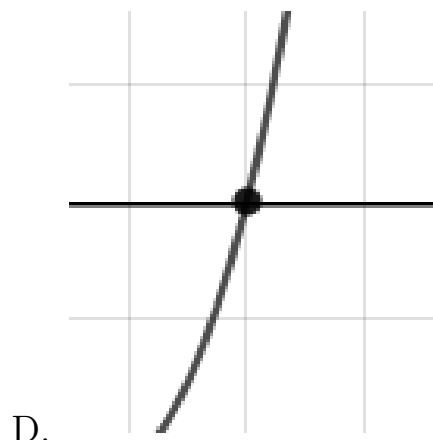
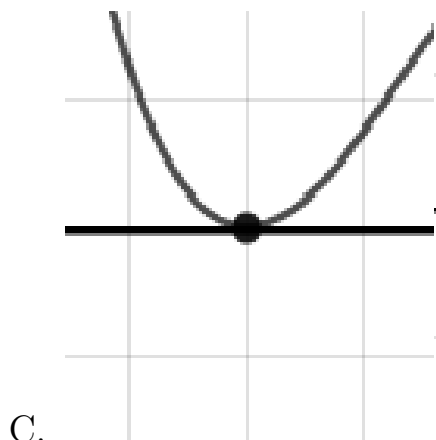


- A. $9x^9(x-1)^8(x+1)^{11}$
- B. $-9x^8(x-1)^8(x+1)^7$
- C. $-20x^8(x-1)^4(x+1)^4$
- D. $8x^9(x-1)^8(x+1)^6$
- E. $8x^4(x-1)^4(x+1)^5$

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

$$f(x) = 8(x+4)^9(x-4)^{12}(x-7)^5(x+7)^9$$

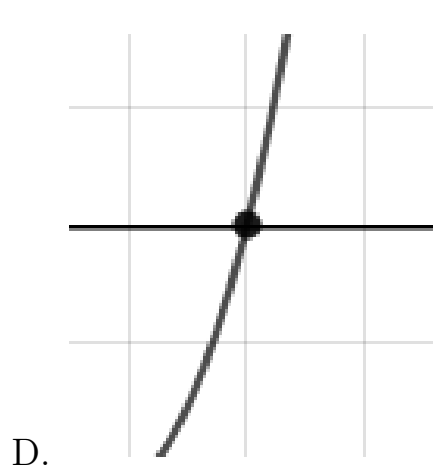
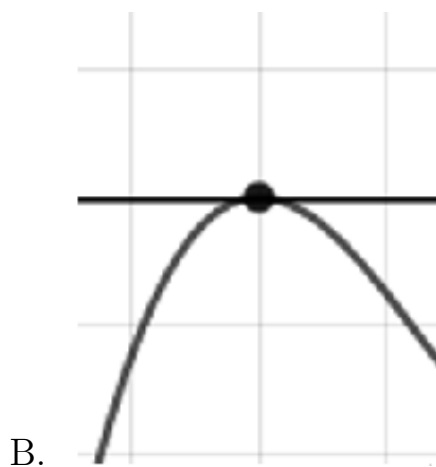
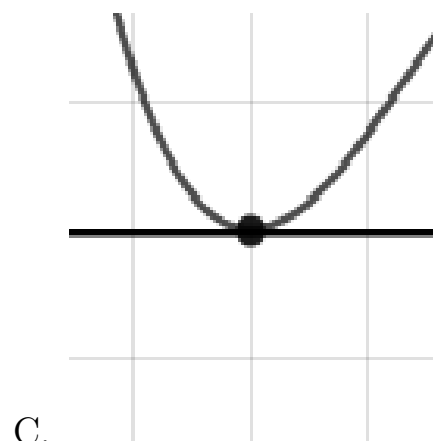
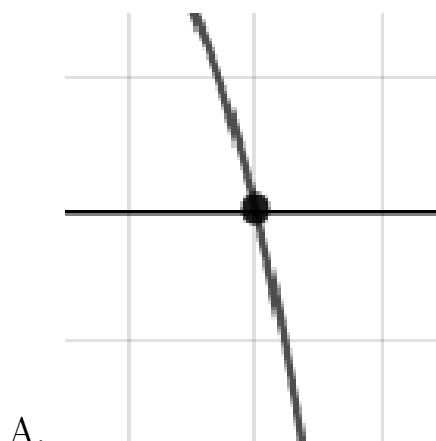




E. None of the above.

5. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = 3(x + 6)^6(x - 6)^2(x - 8)^9(x + 8)^6$$



E. None of the above.

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

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

- A. $b \in [-5, 6], c \in [-9, 1], \text{ and } d \in [7, 22]$
- B. $b \in [-12, -2], c \in [29, 38], \text{ and } d \in [92, 102]$
- C. $b \in [6, 14], c \in [29, 38], \text{ and } d \in [-106, -99]$
- D. $b \in [-5, 6], c \in [-1, 4], \text{ and } d \in [-21, -9]$
- E. None of the above.

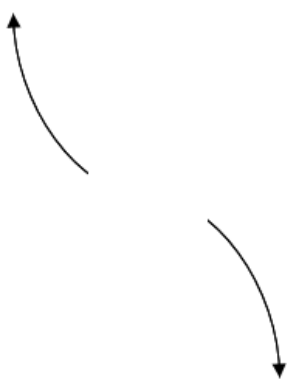
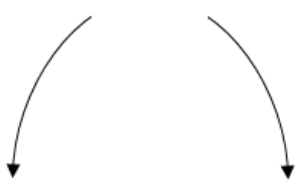

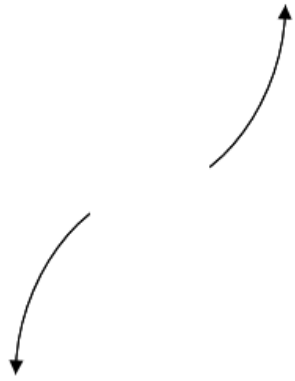
7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{1}{4}, 7, \text{ and } \frac{-7}{5}$$

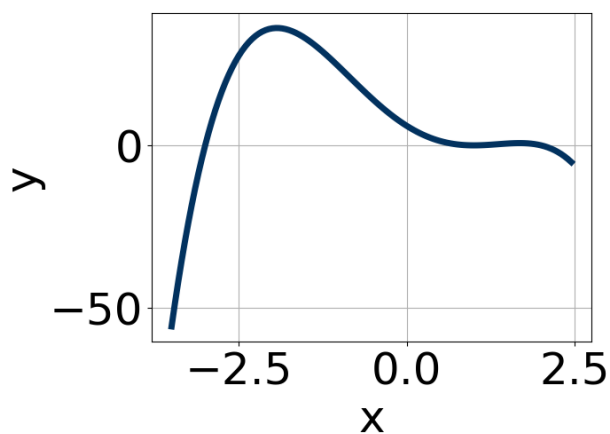
- A. $a \in [20, 22], b \in [-122, -116], c \in [-170, -163], \text{ and } d \in [46, 52]$
- B. $a \in [20, 22], b \in [165, 181], c \in [238, 243], \text{ and } d \in [46, 52]$
- C. $a \in [20, 22], b \in [-109, -104], c \in [-227, -217], \text{ and } d \in [-53, -44]$
- D. $a \in [20, 22], b \in [114, 125], c \in [-170, -163], \text{ and } d \in [-53, -44]$
- E. $a \in [20, 22], b \in [-122, -116], c \in [-170, -163], \text{ and } d \in [-53, -44]$

8. Describe the end behavior of the polynomial below.

$$f(x) = 7(x + 4)^3(x - 4)^8(x - 5)^4(x + 5)^4$$

- A. 
- B. 
- C. 
- D. 
- E. None of the above.

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

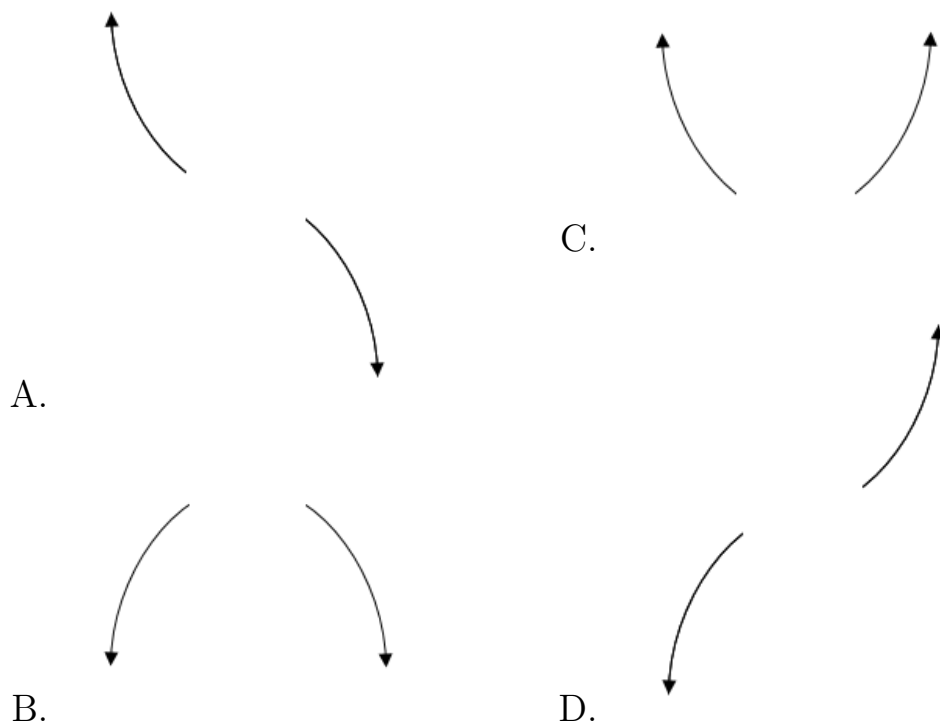


- A. $-5(x - 1)^{10}(x + 3)^6(x - 2)^9$
- B. $3(x - 1)^{10}(x + 3)^9(x - 2)^6$
- C. $-3(x - 1)^{11}(x + 3)^6(x - 2)^9$
- D. $18(x - 1)^6(x + 3)^9(x - 2)^5$

E. $-4(x-1)^4(x+3)^5(x-2)^9$

10. Describe the end behavior of the polynomial below.

$$f(x) = 9(x-6)^2(x+6)^3(x+8)^5(x-8)^7$$



E. None of the above.