

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

$$-\frac{4}{5}, 2, \text{ and } \frac{7}{5}$$

- A.  $a \in [24, 31], b \in [-72, -62], c \in [1, 7], \text{ and } d \in [-56, -55]$   
B.  $a \in [24, 31], b \in [57, 69], c \in [1, 7], \text{ and } d \in [-56, -55]$   
C.  $a \in [24, 31], b \in [-72, -62], c \in [1, 7], \text{ and } d \in [53, 61]$   
D.  $a \in [24, 31], b \in [-105, -101], c \in [138, 141], \text{ and } d \in [-56, -55]$   
E.  $a \in [24, 31], b \in [-11, -3], c \in [-87, -79], \text{ and } d \in [53, 61]$
- 

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

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

- A.  $b \in [-1.82, 0.38], c \in [3.17, 4.11], \text{ and } d \in [79, 85]$   
B.  $b \in [-1.82, 0.38], c \in [3.17, 4.11], \text{ and } d \in [-80, -76]$   
C.  $b \in [0.07, 1.76], c \in [1.42, 3.02], \text{ and } d \in [-10, -5]$   
D.  $b \in [0.07, 1.76], c \in [-0.67, 0.1], \text{ and } d \in [-18, -10]$   
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  $x^3 + bx^2 + cx + d$ .

$$3 + 4i \text{ and } 2$$

- A.  $b \in [0, 2], c \in [-6.65, -5.66], \text{ and } d \in [8, 12]$   
B.  $b \in [-14, -4], c \in [37, 37.08], \text{ and } d \in [-56, -49]$

- C.  $b \in [6, 11], c \in [37, 37.08]$ , and  $d \in [47, 56]$   
 D.  $b \in [0, 2], c \in [-5.69, -4.9]$ , and  $d \in [3, 7]$   
 E. None of the above.

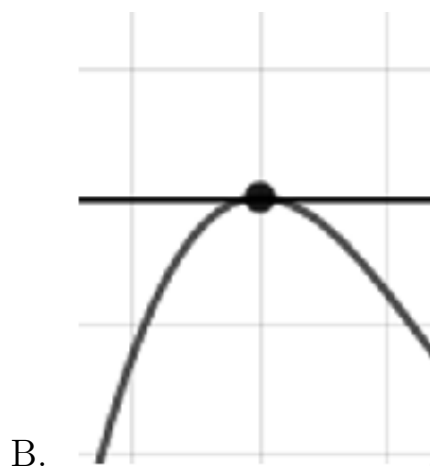
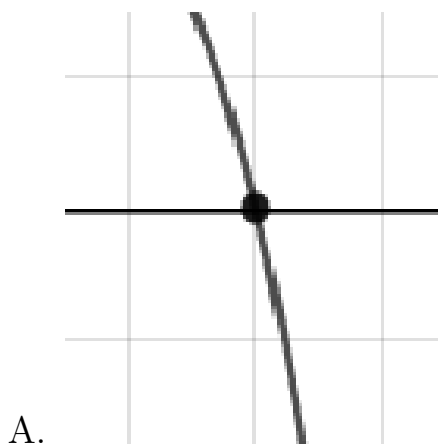
4. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form  $ax^3 + bx^2 + cx + d$ .

$$-6, \frac{-7}{4}, \text{ and } \frac{1}{4}$$

- A.  $a \in [11, 21], b \in [117, 121], c \in [134, 138]$ , and  $d \in [-47, -41]$   
 B.  $a \in [11, 21], b \in [-122, -115], c \in [134, 138]$ , and  $d \in [42, 43]$   
 C.  $a \in [11, 21], b \in [-72, -70], c \in [-152, -143]$ , and  $d \in [42, 43]$   
 D.  $a \in [11, 21], b \in [117, 121], c \in [134, 138]$ , and  $d \in [42, 43]$   
 E.  $a \in [11, 21], b \in [-131, -122], c \in [197, 201]$ , and  $d \in [-47, -41]$

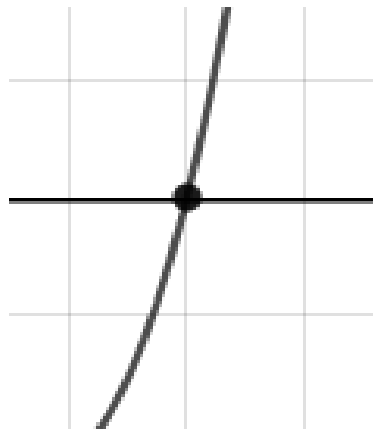
5. Describe the zero behavior of the zero  $x = -7$  of the polynomial below.

$$f(x) = 9(x + 7)^8(x - 7)^9(x + 3)^4(x - 3)^5$$





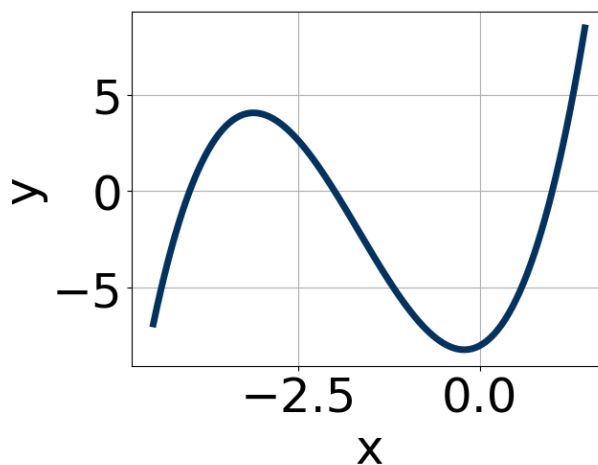
C.



D.

E. None of the above.

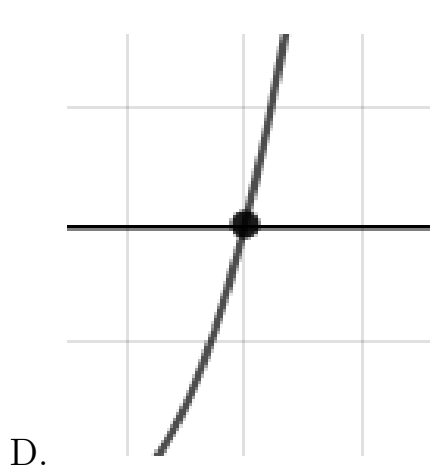
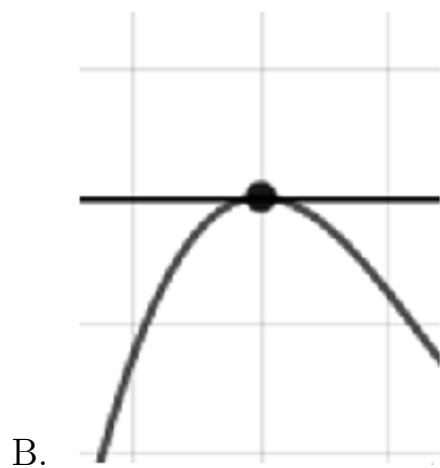
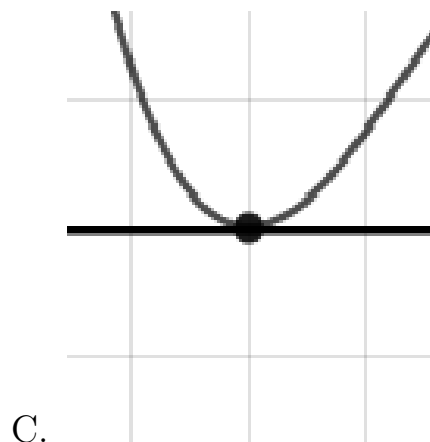
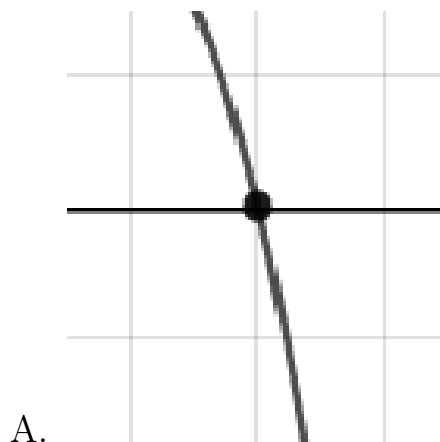
6. Which of the following equations *could* be of the graph presented below?



- A.  $12(x + 4)^{10}(x - 1)^{11}(x + 2)^5$
- B.  $14(x + 4)^{10}(x - 1)^6(x + 2)^{11}$
- C.  $-6(x + 4)^6(x - 1)^5(x + 2)^9$
- D.  $-9(x + 4)^9(x - 1)^7(x + 2)^5$
- E.  $12(x + 4)^7(x - 1)^7(x + 2)^5$

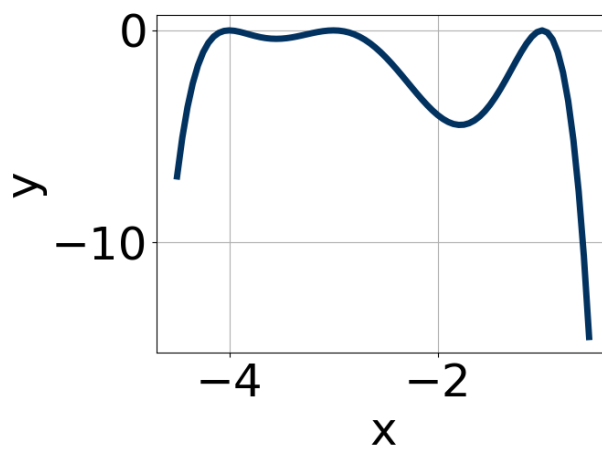
7. Describe the zero behavior of the zero  $x = 7$  of the polynomial below.

$$f(x) = -4(x + 2)^5(x - 2)^3(x + 7)^7(x - 7)^6$$



E. None of the above.

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

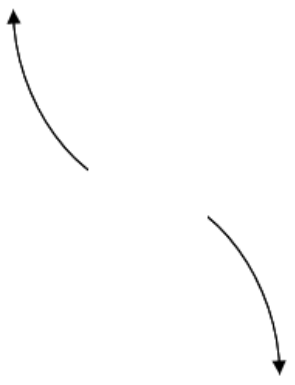
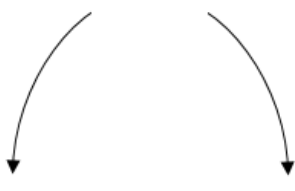
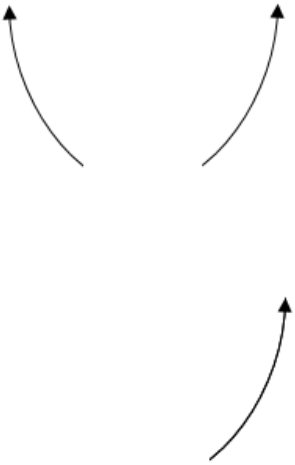
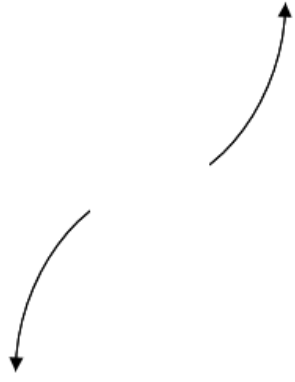


A.  $10(x + 3)^{10}(x + 4)^8(x + 1)^{10}$

- B.  $-12(x + 3)^{10}(x + 4)^6(x + 1)^4$
- C.  $7(x + 3)^8(x + 4)^8(x + 1)^{11}$
- D.  $-6(x + 3)^4(x + 4)^{11}(x + 1)^9$
- E.  $-19(x + 3)^6(x + 4)^8(x + 1)^7$

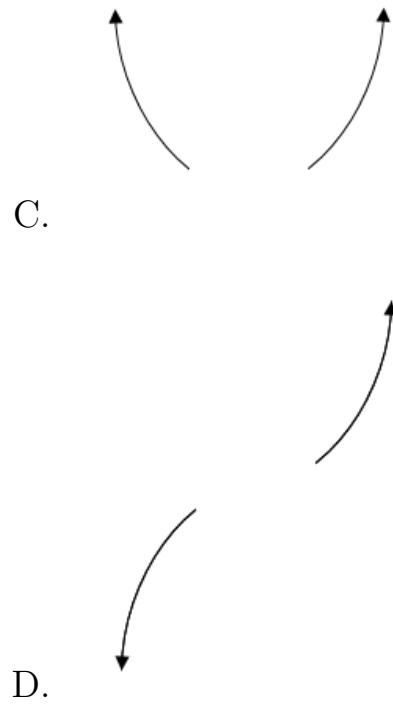
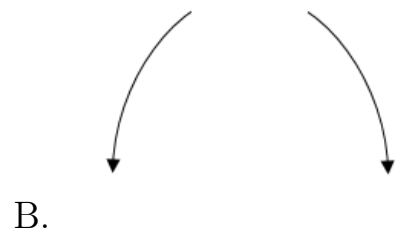
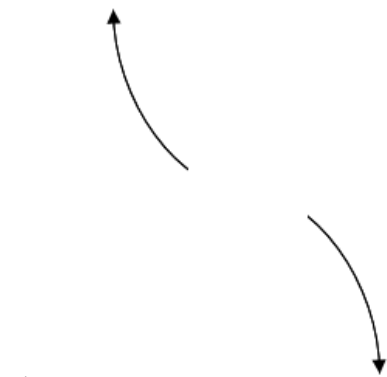
9. Describe the end behavior of the polynomial below.

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

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

10. Describe the end behavior of the polynomial below.

$$f(x) = -5(x - 3)^4(x + 3)^7(x - 5)^5(x + 5)^6$$



E. None of the above.