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

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

A. $b \in [0, 8], c \in [-9, -1],$ and $d \in [-1, 6]$

B. $b \in [0, 8], c \in [0, 10],$ and $d \in [-6, 2]$

C. $b \in [-14, -8], c \in [30, 39],$ and $d \in [40, 48]$

D. $b \in [7, 15], c \in [30, 39],$ and $d \in [-46, -29]$

E. None of the above.

---

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

$$\frac{1}{4}, \frac{2}{3}, \text{ and } -7$$

A. $a \in [3, 16], b \in [70, 76], c \in [-84, -73],$ and $d \in [-18, -11]$

B. $a \in [3, 16], b \in [92, 96], c \in [72, 87],$ and $d \in [8, 15]$

C. $a \in [3, 16], b \in [78, 85], c \in [-44, -33],$ and $d \in [-18, -11]$

D. $a \in [3, 16], b \in [70, 76], c \in [-84, -73],$ and $d \in [8, 15]$

E. $a \in [3, 16], b \in [-76, -67], c \in [-84, -73],$ and $d \in [-18, -11]$

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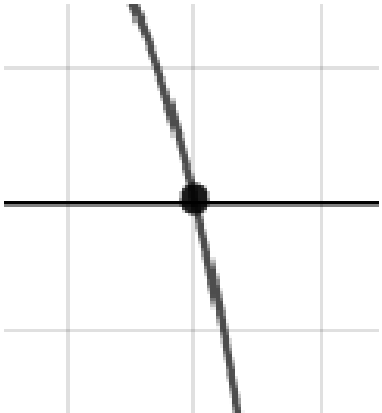
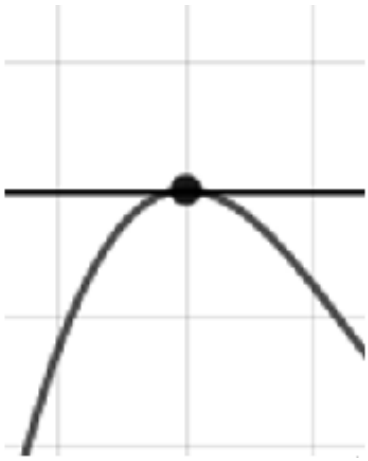
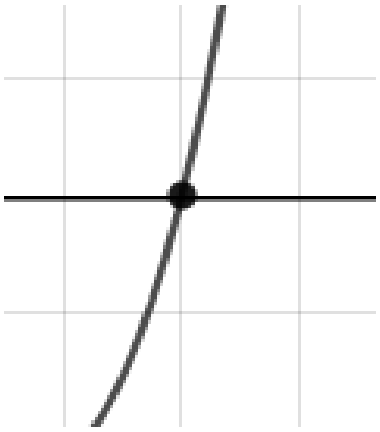
3. Describe the zero behavior of the zero $x = 3$ of the polynomial below.

$$f(x) = -9(x - 6)^5(x + 6)^4(x + 3)^{11}(x - 3)^8$$



B. 

C. 

D. 

E. None of the above.

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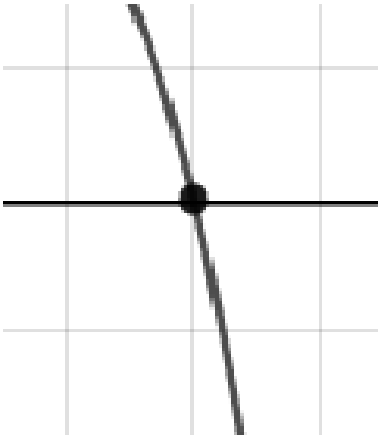
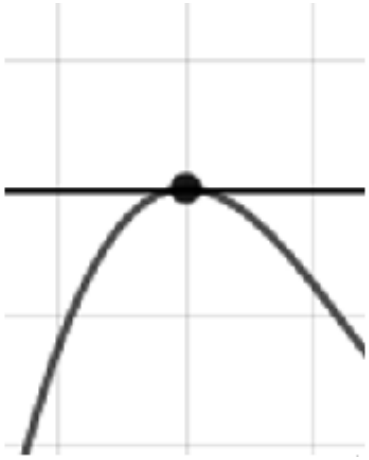
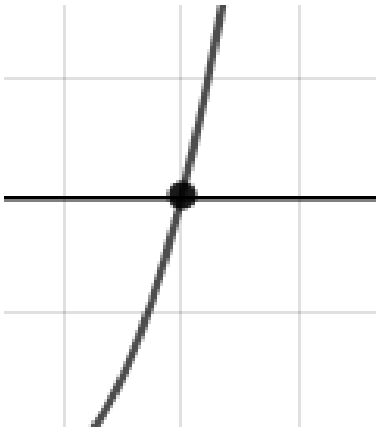
4. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

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

A. 

B. 

C. 

D. 

E. None of the above.

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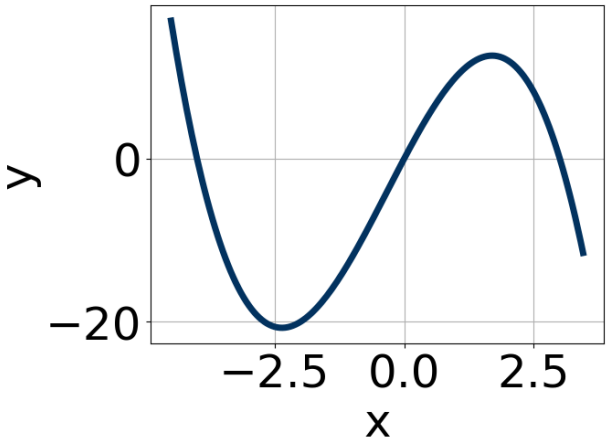
5. Which of the following equations *could* be of the graph presented below?



A. $-17x^9(x+4)^6(x-3)^{11}$

B. $-19x^{10}(x+4)^6(x-3)^7$

C. $-8x^9(x+4)^9(x-3)^7$

D. $13x^{11}(x+4)^7(x-3)^7$

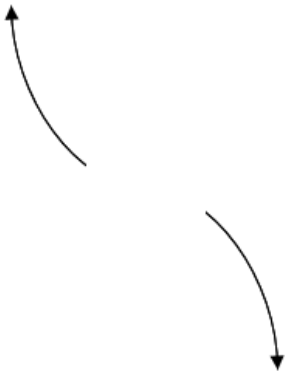
E. $16x^7(x+4)^{10}(x-3)^9$

---

6. Describe the end behavior of the polynomial below.

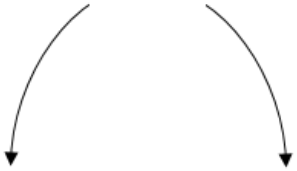
$$f(x) = -3(x+5)^5(x-5)^8(x+9)^2(x-9)^3$$

A.

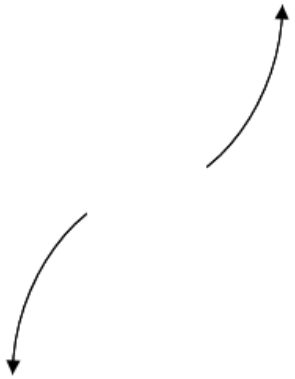


C.

B.



D.



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 $x^3 + bx^2 + cx + d$.

$$4 - 3i \text{ and } -1$$

A. $b \in [6, 11], c \in [16, 18],$ and $d \in [-26, -24]$

B. $b \in [-9, -4], c \in [16, 18],$ and $d \in [20, 28]$

C. $b \in [-2, 6], c \in [-4, -2],$ and $d \in [-4, -1]$

D. $b \in [-2, 6], c \in [3, 5],$ and $d \in [-1, 8]$

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 $ax^3 + bx^2 + cx + d$.

$$\frac{-2}{3}, \frac{-1}{4}, \text{ and } \frac{7}{4}$$

A. $a \in [44, 54], b \in [-110, -98], c \in [21, 29], \text{ and } d \in [9, 22]$

B. $a \in [44, 54], b \in [-41, -35], c \in [-74, -64], \text{ and } d \in [-15, -11]$

C. $a \in [44, 54], b \in [-41, -35], c \in [-74, -64], \text{ and } d \in [9, 22]$

D. $a \in [44, 54], b \in [-134, -124], c \in [85, 86], \text{ and } d \in [-15, -11]$

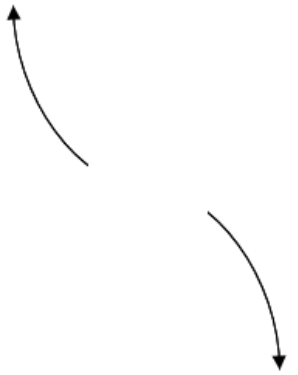
E. $a \in [44, 54], b \in [40, 42], c \in [-74, -64], \text{ and } d \in [9, 22]$

---

9. Describe the end behavior of the polynomial below.

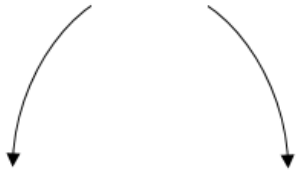
$$f(x) = 3(x-3)^2(x+3)^7(x+9)^5(x-9)^7$$

A.

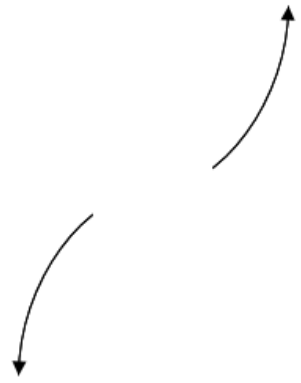


C.

B.



D.



E. None of the above.

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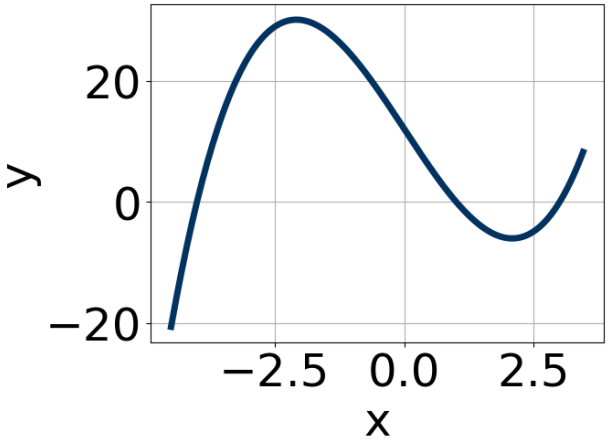
10. Which of the following equations *could* be of the graph presented below?



A. $17(x-1)^{10}(x-3)^{6}(x+4)^{11}$

B. $-20(x-1)^{10}(x-3)^{11}(x+4)^{11}$

C. $4(x-1)^{8}(x-3)^{11}(x+4)^{5}$

D. $-20(x-1)^{11}(x-3)^{5}(x+4)^{5}$

E. $4(x-1)^{11}(x-3)^{11}(x+4)^{9}$
