

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

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

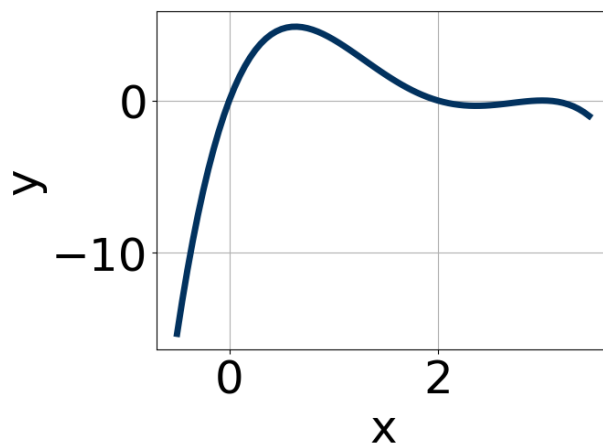
- A. $b \in [11, 13], c \in [42, 45],$ and $d \in [52, 62]$
B. $b \in [-1, 6], c \in [0, 3],$ and $d \in [-13, -2]$
C. $b \in [-11, -7], c \in [42, 45],$ and $d \in [-60, -51]$
D. $b \in [-1, 6], c \in [5, 16],$ and $d \in [9, 15]$
E. None of the above.
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2. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

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

- A. $a \in [17, 24], b \in [44, 46], c \in [-22, -11],$ and $d \in [-5, 2]$
B. $a \in [17, 24], b \in [48, 59], c \in [5, 16],$ and $d \in [-4, 7]$
C. $a \in [17, 24], b \in [63, 71], c \in [35, 38],$ and $d \in [-4, 7]$
D. $a \in [17, 24], b \in [48, 59], c \in [5, 16],$ and $d \in [-5, 2]$
E. $a \in [17, 24], b \in [-60, -53], c \in [5, 16],$ and $d \in [-4, 7]$
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3. Which of the following equations *could* be of the graph presented below?

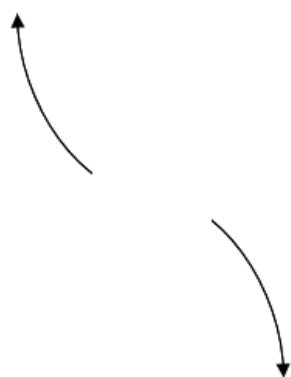


- A. $-4x^7(x-3)^4(x-2)^6$
- B. $14x^{11}(x-3)^8(x-2)^{11}$
- C. $-7x^5(x-3)^5(x-2)^{10}$
- D. $-20x^7(x-3)^4(x-2)^{11}$
- E. $16x^8(x-3)^6(x-2)^9$

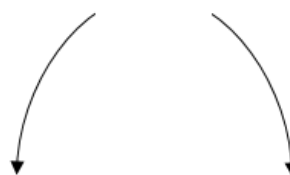
4. Describe the end behavior of the polynomial below.

$$f(x) = 6(x+5)^5(x-5)^8(x+9)^4(x-9)^5$$

A.

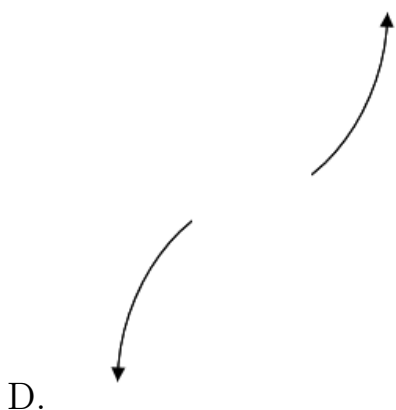


B.



C.





D.

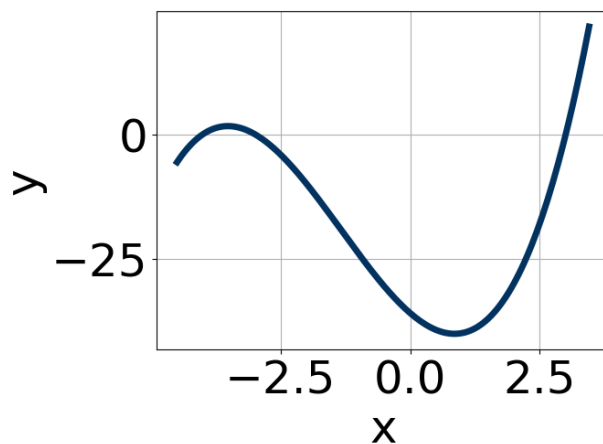
E. None of the above.

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

$$\frac{-7}{5}, -3, \text{ and } 6$$

- A. $a \in [3, 6], b \in [-55, -49], c \in [153, 155],$ and $d \in [-130, -115]$
- B. $a \in [3, 6], b \in [4, 14], c \in [-114, -110],$ and $d \in [124, 127]$
- C. $a \in [3, 6], b \in [-11, -4], c \in [-114, -110],$ and $d \in [124, 127]$
- D. $a \in [3, 6], b \in [-11, -4], c \in [-114, -110],$ and $d \in [-130, -115]$
- E. $a \in [3, 6], b \in [-25, -18], c \in [-72, -66],$ and $d \in [124, 127]$

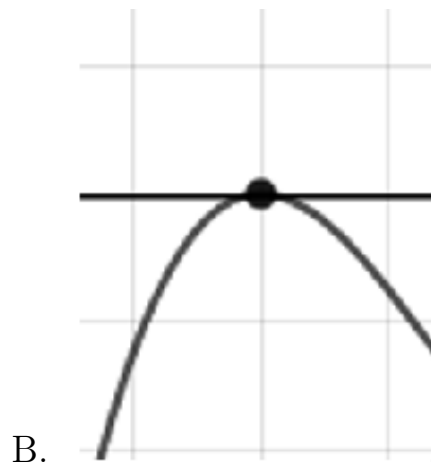
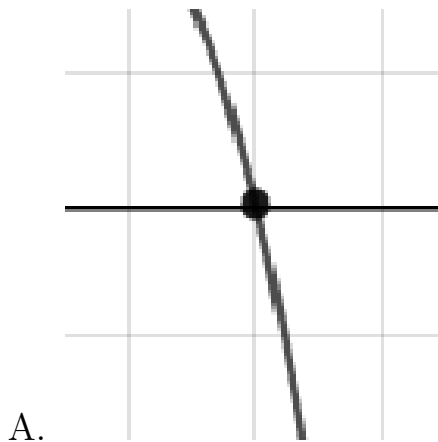
6. Which of the following equations *could* be of the graph presented below?



- A. $15(x - 3)^4(x + 3)^{10}(x + 4)^{11}$
- B. $-19(x - 3)^6(x + 3)^9(x + 4)^9$
- C. $15(x - 3)^6(x + 3)^9(x + 4)^7$
- D. $2(x - 3)^7(x + 3)^9(x + 4)^7$
- E. $-10(x - 3)^7(x + 3)^{11}(x + 4)^{11}$

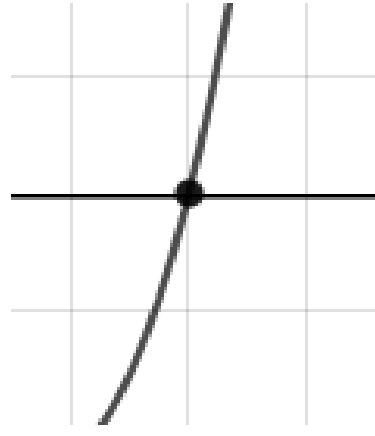
7. Describe the zero behavior of the zero $x = 5$ of the polynomial below.

$$f(x) = 4(x + 5)^5(x - 5)^8(x - 2)^4(x + 2)^8$$





C.



D.

E. None of the above.

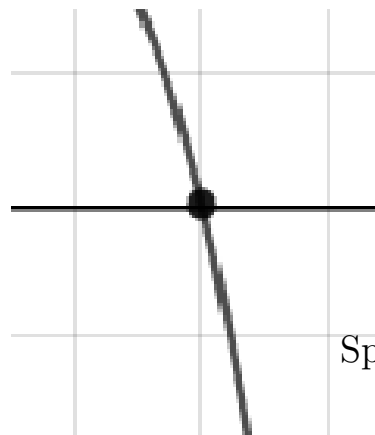
8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$5 - 3i \text{ and } -2$$

- A. $b \in [0, 5], c \in [-4, 2]$, and $d \in [-16, -1]$
 B. $b \in [6, 12], c \in [8, 22]$, and $d \in [-76, -63]$
 C. $b \in [-8, -4], c \in [8, 22]$, and $d \in [63, 75]$
 D. $b \in [0, 5], c \in [4, 13]$, and $d \in [-1, 10]$
 E. None of the above.

9. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

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



A.

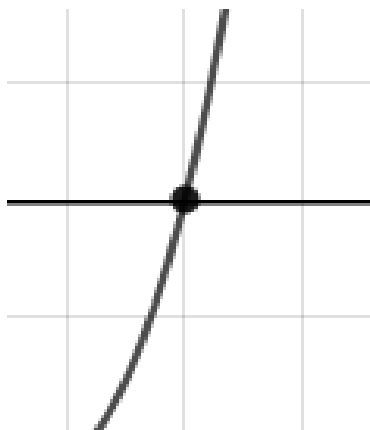
B.



C.



D.

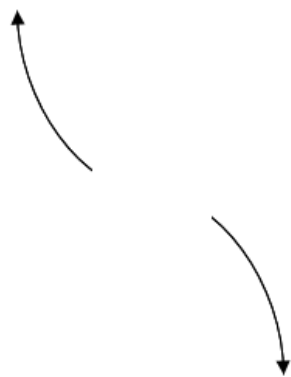


E. None of the above.

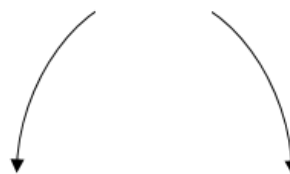
10. Describe the end behavior of the polynomial below.

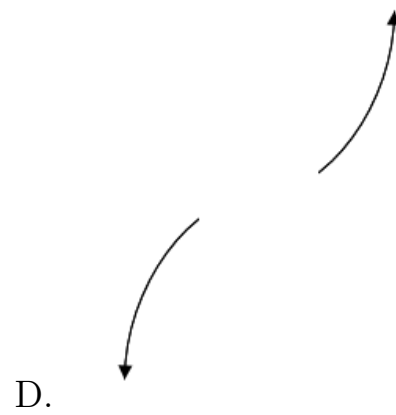
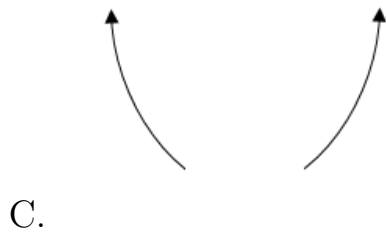
$$f(x) = 8(x + 2)^5(x - 2)^8(x + 3)^2(x - 3)^2$$

A.



B.





E. None of the above.
