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

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

A. $b \in [7, 11], c \in [2.8, 4.9],$ and $d \in [-111, -99]$

B. $b \in [-13, -3], c \in [2.8, 4.9],$ and $d \in [92, 105]$

C. $b \in [-5, 2], c \in [-5.1, -1],$ and $d \in [-19, -11]$

D. $b \in [-5, 2], c \in [-1.5, 3.7],$ and $d \in [-13, -7]$

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

$$\frac{-5}{3}, \frac{7}{2}, \text{ and } \frac{3}{5}$$

A. $a \in [30, 34], b \in [-76, -69], c \in [-148, -138],$ and $d \in [-107, -100]$

B. $a \in [30, 34], b \in [68, 75], c \in [-148, -138],$ and $d \in [-107, -100]$

C. $a \in [30, 34], b \in [-174, -166], c \in [267, 273],$ and $d \in [-107, -100]$

D. $a \in [30, 34], b \in [-76, -69], c \in [-148, -138],$ and $d \in [104, 107]$

E. $a \in [30, 34], b \in [36, 39], c \in [-208, -198],$ and $d \in [104, 107]$

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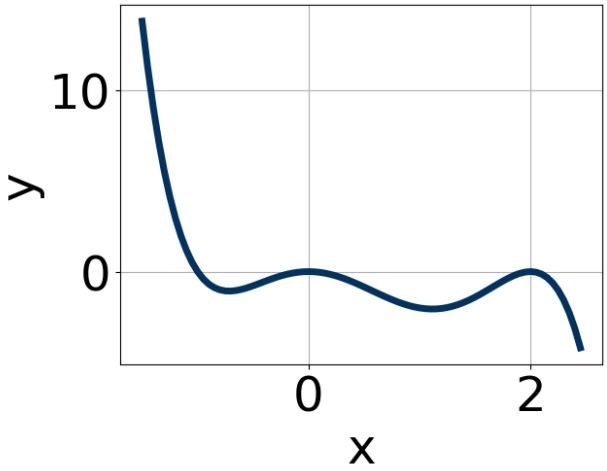
3. Which of the following equations *could* be of the graph presented below?



A. $-14x^6(x-2)^{10}(x+1)^9$

B. $6x^6(x-2)^8(x+1)^{11}$

C. $20x^{10}(x-2)^6(x+1)^8$

D. $-4x^{10}(x-2)^5(x+1)^9$

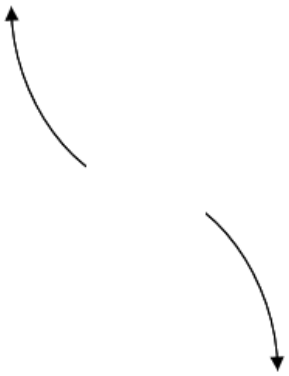
E. $-8x^{10}(x-2)^7(x+1)^8$

---

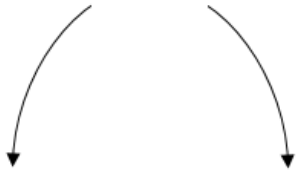
4. Describe the end behavior of the polynomial below.

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

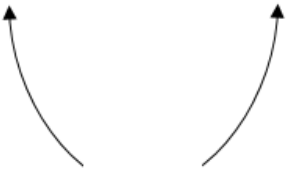
A.

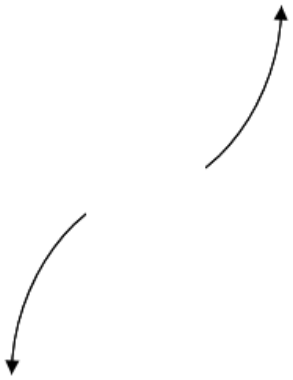


B.



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

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

A. $a \in [4, 15], b \in [32, 36], c \in [41, 45],$ and $d \in [10, 17]$

B. $a \in [4, 15], b \in [19, 30], c \in [1, 17],$ and $d \in [-17, -11]$

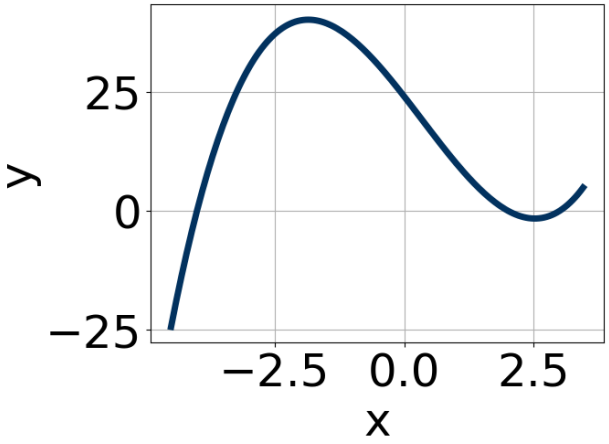
C. $a \in [4, 15], b \in [-24, -14], c \in [-50, -34],$ and $d \in [-17, -11]$

D. $a \in [4, 15], b \in [-33, -26], c \in [1, 17],$ and $d \in [10, 17]$

E. $a \in [4, 15], b \in [-33, -26], c \in [1, 17],$ and $d \in [-17, -11]$

---

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



A. $14(x-2)^{11}(x-3)^5(x+4)^5$

B. $-6(x-2)^5(x-3)^9(x+4)^{11}$

C. $4(x-2)^6(x-3)^5(x+4)^{11}$

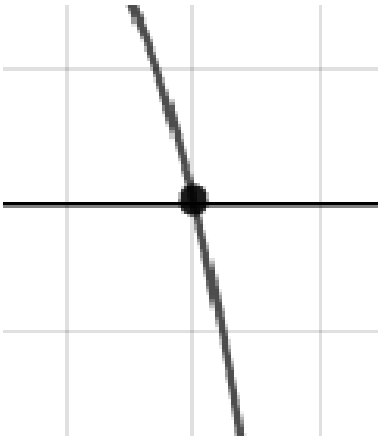
D. $7(x-2)^{10}(x-3)^{10}(x+4)^7$

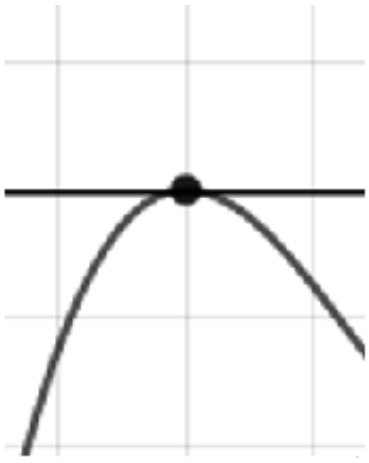
E. $-15(x-2)^4(x-3)^9(x+4)^5$

---

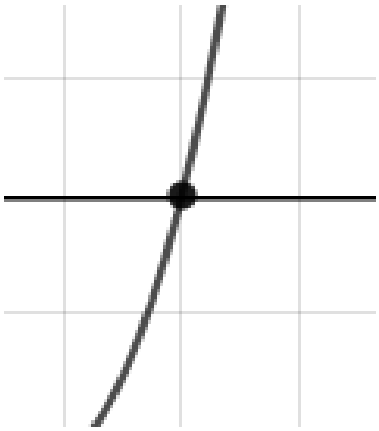
7. Describe the zero behavior of the zero $x=-9$ of the polynomial below.

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

A. 

B. 

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

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

A. $b \in [1, 11], c \in [-11, 0],$ and $d \in [10, 17]$

B. $b \in [3, 13], c \in [71, 75],$ and $d \in [163, 167]$

C. $b \in [1, 11], c \in [-2, 6],$ and $d \in [-27, -17]$

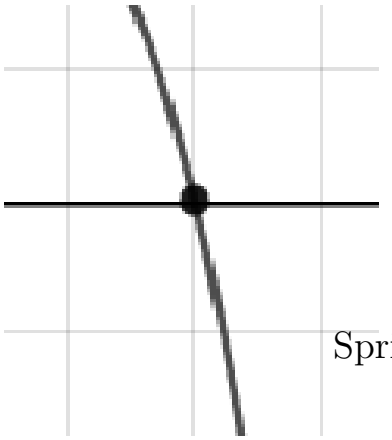
D. $b \in [-16, -8], c \in [71, 75],$ and $d \in [-165, -163]$

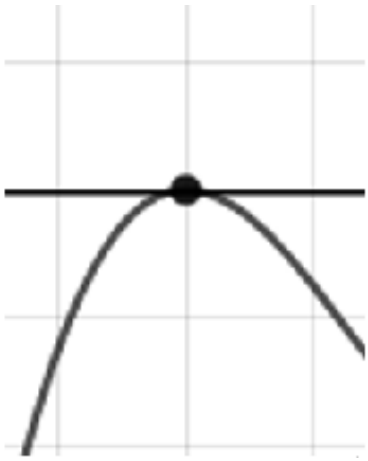
E. None of the above.

---

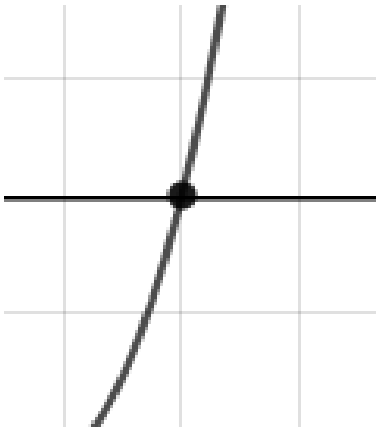
9. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

$$f(x) = 4(x + 9)^8(x - 9)^9(x + 8)^9(x - 8)^{10}$$

A. 

B. 

C. 

D. 

E. None of the above.

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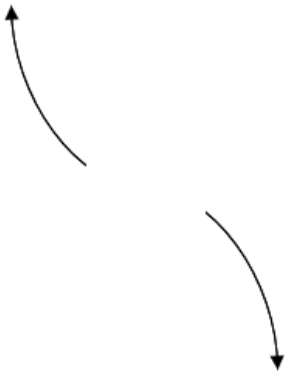
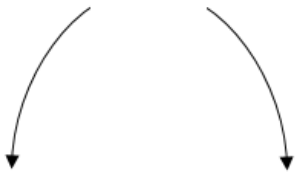
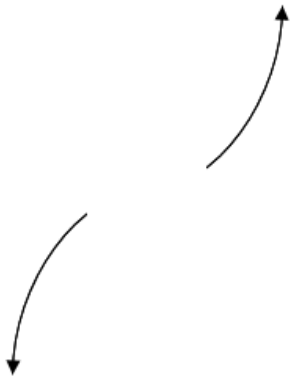
10. Describe the end behavior of the polynomial below.

$$f(x) = 2(x-8)^4(x+8)^5(x-6)^2(x+6)^3$$

A. 

B. 

C. 

D. 

E. None of the above.
