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

$$\frac{4}{5}, \frac{3}{2}, \text{ and } \frac{7}{4}$$

A. $a \in [38, 45], b \in [-98, -95], c \in [-1, 4],$ and $d \in [76, 87]$

B. $a \in [38, 45], b \in [-167, -157], c \in [204, 222],$ and $d \in [-85, -78]$

C. $a \in [38, 45], b \in [22, 24], c \in [-118, -107],$ and $d \in [-85, -78]$

D. $a \in [38, 45], b \in [-167, -157], c \in [204, 222],$ and $d \in [76, 87]$

E. $a \in [38, 45], b \in [158, 163], c \in [204, 222],$ and $d \in [76, 87]$

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

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

A. $b \in [1.07, 2.48], c \in [-1.6, 0.7],$ and $d \in [-21, -13]$

B. $b \in [-3.13, -1.69], c \in [-1.6, 0.7],$ and $d \in [13, 22]$

C. $b \in [0.96, 1.95], c \in [-5.5, -3.4],$ and $d \in [4, 9]$

D. $b \in [0.96, 1.95], c \in [-1.6, 0.7],$ and $d \in [-9, -3]$

E. None of the above.

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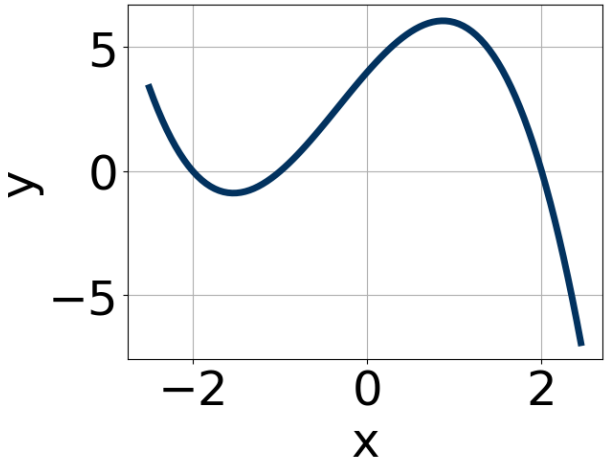
3. Which of the following equations *could* be of the graph presented below?



A. $15(x+1)^9(x-2)^5(x+2)^7$

B. $-14(x+1)^{11}(x-2)^9(x+2)^7$

C. $19(x+1)^6(x-2)^5(x+2)^9$

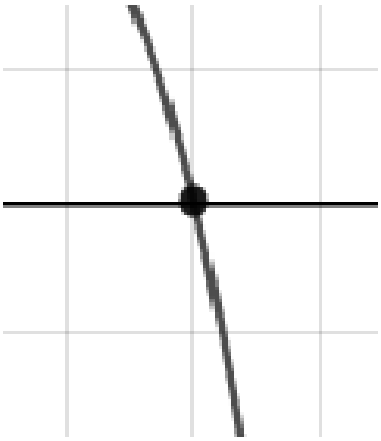
D. $-13(x+1)^{10}(x-2)^{10}(x+2)^{11}$

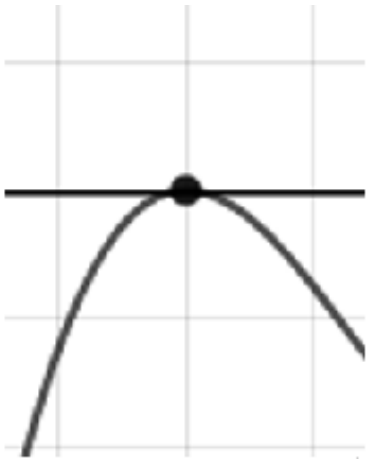
E. $-8(x+1)^{10}(x-2)^7(x+2)^9$

---

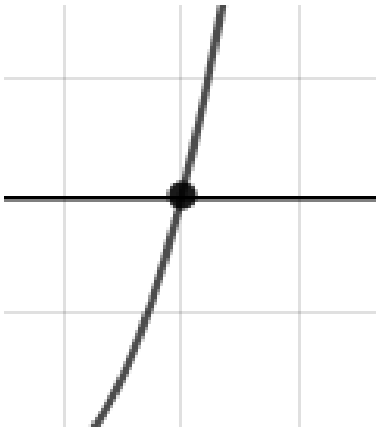
4. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

$$f(x) = -2(x+9)^2(x-9)^7(x-4)^5(x+4)^9$$

A. 

B. 

C. 

D. 

E. None of the above.

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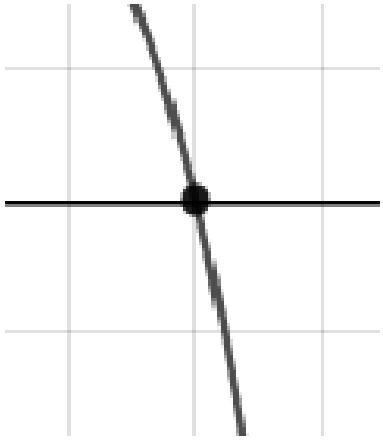
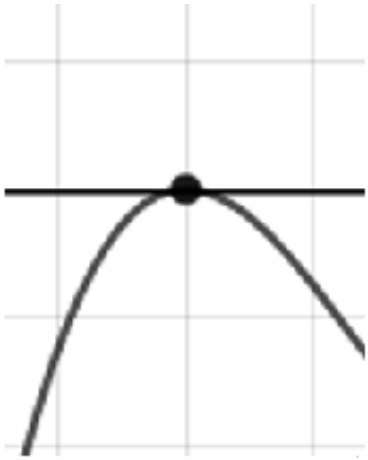
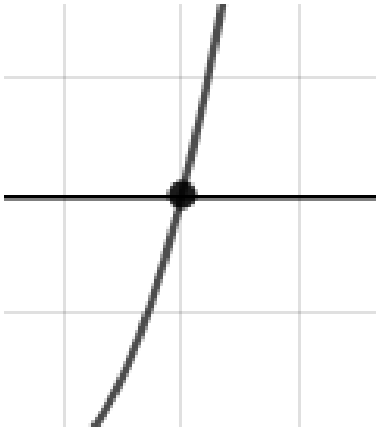
5. Describe the zero behavior of the zero $x = 6$ of the polynomial below.

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

A. 

C. 

B. 

D. 

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

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

A. $b \in [-12, -4], c \in [4.8, 9.5],$ and $d \in [58, 60]$

B. $b \in [1, 4], c \in [-7.7, 1.2],$ and $d \in [-5, 3]$

C. $b \in [1, 4], c \in [2.7, 3.6],$ and $d \in [-11, -8]$

D. $b \in [3, 14], c \in [4.8, 9.5],$ and $d \in [-63, -54]$

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

$$4, \frac{7}{3}, \text{ and } \frac{1}{5}$$

A. $a \in [11, 20], b \in [13, 26], c \in [-145, -141],$ and $d \in [21, 36]$

B. $a \in [11, 20], b \in [98, 105], c \in [158, 162],$ and $d \in [21, 36]$

C. $a \in [11, 20], b \in [-101, -96], c \in [158, 162],$ and $d \in [21, 36]$

D. $a \in [11, 20], b \in [-101, -96], c \in [158, 162],$ and $d \in [-31, -27]$

E. $a \in [11, 20], b \in [89, 93], c \in [115, 123],$ and $d \in [-31, -27]$

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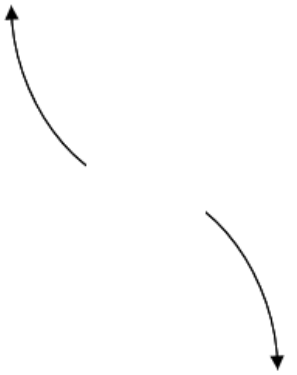
8. Describe the end behavior of the polynomial below.

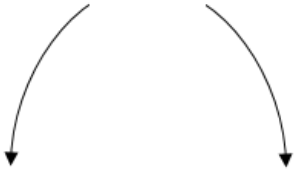
$$f(x) = -3(x + 2)^5(x - 2)^6(x + 6)^4(x - 6)^6$$

A.

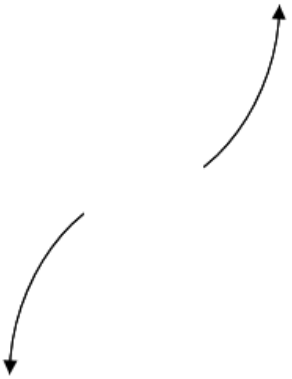


C.

B.



D.



E. None of the above.

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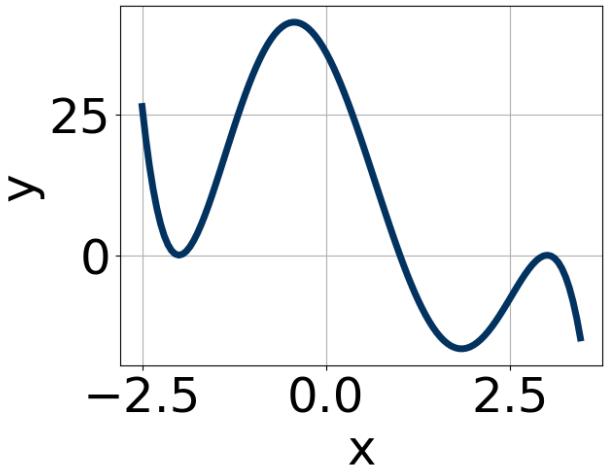
9. Which of the following equations *could* be of the graph presented below?



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

B. $-8(x-3)^{10}(x+2)^5(x-1)^9$

C. $4(x-3)^{10}(x+2)^8(x-1)^7$

D. $-17(x-3)^8(x+2)^4(x-1)^{11}$

E. $20(x-3)^{10}(x+2)^6(x-1)^6$

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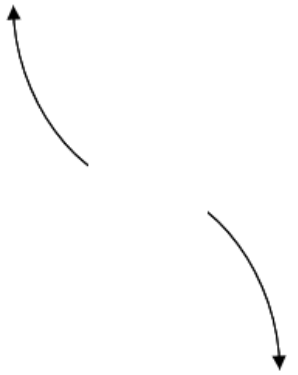
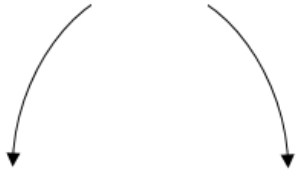
10. Describe the end behavior of the polynomial below.

$$f(x) = -8(x+2)^2(x-2)^7(x-8)^2(x+8)^2$$

A.

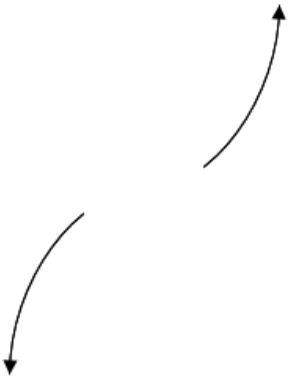


B.



C.

D.



E. None of the above.
