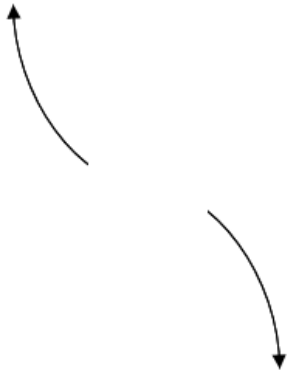
1. Describe the end behavior of the polynomial below.

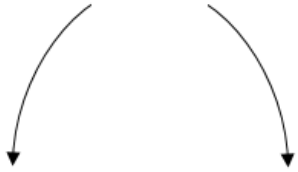
$$f(x) = 7(x+2)^2(x-2)^3(x+8)^2(x-8)^4$$

A.

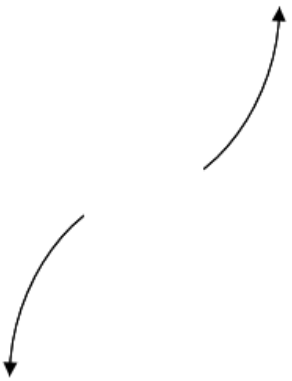


C.

B.



D.



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

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

A. $a \in [19, 30], b \in [-70, -63], c \in [-249, -243],$ and $d \in [-143, -137]$

B. $a \in [19, 30], b \in [-187, -178], c \in [302, 305],$ and $d \in [-143, -137]$

C. $a \in [19, 30], b \in [62, 76], c \in [-249, -243],$ and $d \in [140, 144]$

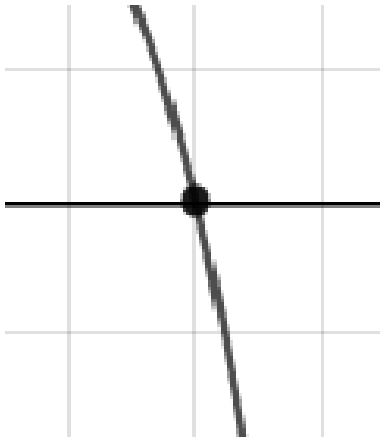
D. $a \in [19, 30], b \in [-143, -137], c \in [45, 48],$ and $d \in [140, 144]$

E. $a \in [19, 30], b \in [-70, -63], c \in [-249, -243],$ and $d \in [140, 144]$

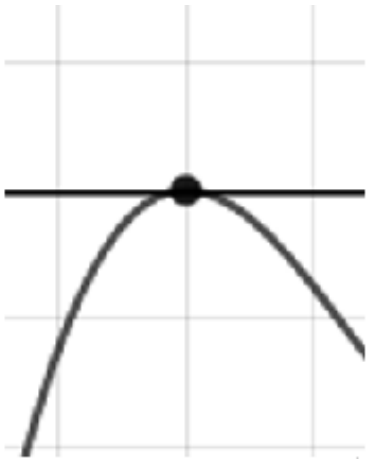
---

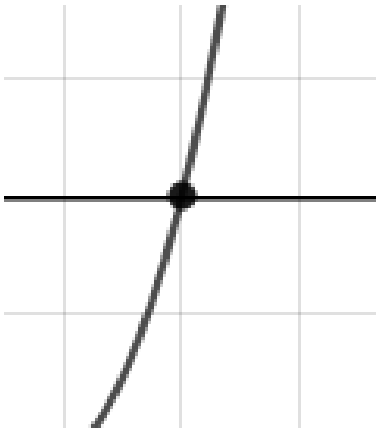
3. Describe the zero behavior of the zero $x = -6$ of the polynomial below.

$$f(x) = 4(x-6)^5(x+6)^{10}(x+3)^7(x-3)^9$$

A. 

C. 

B. 

D. 

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

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

A. $b \in [1, 7], c \in [0, 9],$ and $d \in [-11, -9]$

B. $b \in [1, 7], c \in [-14, -5],$ and $d \in [8, 12]$

C. $b \in [-20, -8], c \in [63, 71],$ and $d \in [-104, -92]$

D. $b \in [11, 17], c \in [63, 71],$ and $d \in [98, 106]$

E. None of the above.

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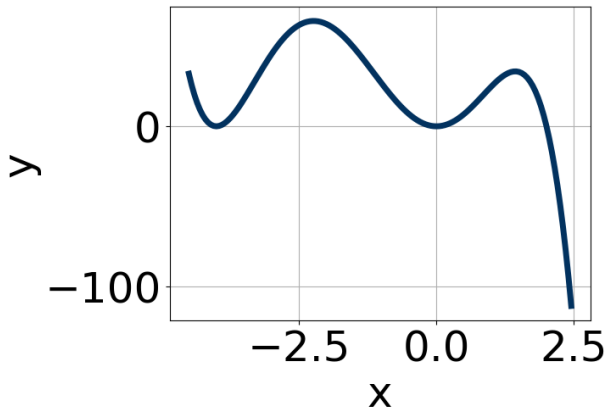
5. Which of the following equations *could* be of the graph presented below?



A. $-12x^4(x+4)^8(x-2)^7$

B. $-11x^9(x+4)^{10}(x-2)^9$

C. $4x^4(x+4)^8(x-2)^9$

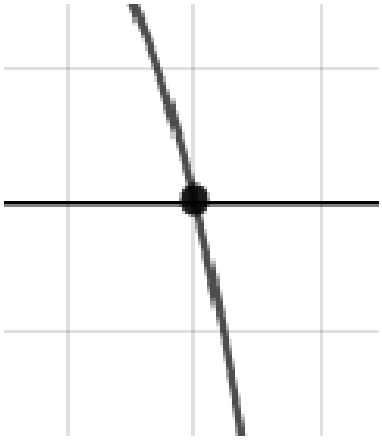
D. $11x^8(x+4)^4(x-2)^8$

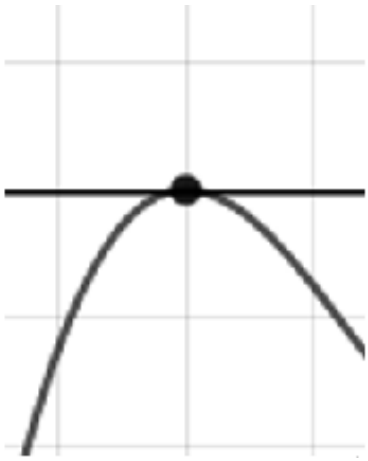
E. $-12x^9(x+4)^8(x-2)^4$

---

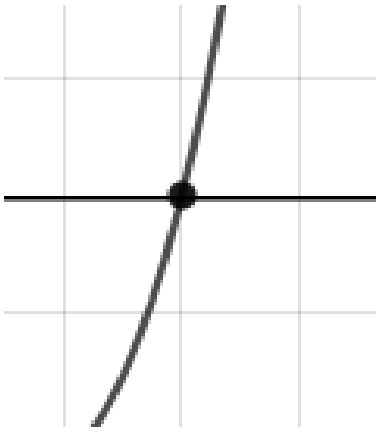
6. Describe the zero behavior of the zero $x = 4$ of the polynomial below.

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

A. 

B. 

C. 

D. 

E. None of the above.

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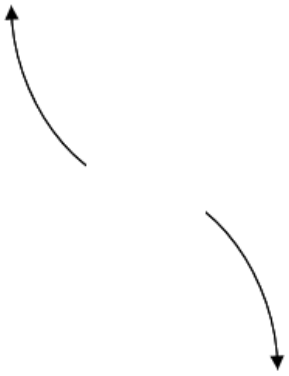
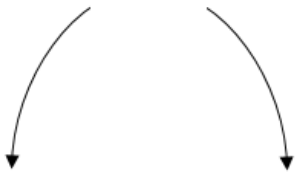
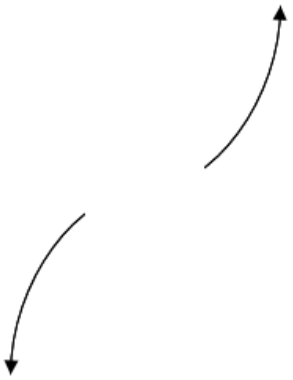
7. Describe the end behavior of the polynomial below.

$$f(x) = -8(x+9)^2(x-9)^7(x+5)^5(x-5)^6$$

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

$$-5 + 3i \text{ and } 4$$

A. $b \in [0, 4], c \in [-2.1, 2],$ and $d \in [-25, -13]$

B. $b \in [0, 4], c \in [-7.1, -6.5],$ and $d \in [10, 14]$

C. $b \in [4, 15], c \in [-6.9, -5.4],$ and $d \in [-140, -129]$

D. $b \in [-11, -4], c \in [-6.9, -5.4],$ and $d \in [136, 144]$

E. None of the above.

---

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

$$\frac{-1}{3}, \frac{-6}{5}, \text{ and } \frac{4}{3}$$

A. $a \in [45, 55], b \in [9, 16], c \in [-77.5, -73.9],$ and $d \in [21, 28]$

B. $a \in [45, 55], b \in [9, 16], c \in [-77.5, -73.9],$ and $d \in [-24, -21]$

C. $a \in [45, 55], b \in [-13, -5], c \in [-77.5, -73.9],$ and $d \in [21, 28]$

D. $a \in [45, 55], b \in [-24, -13], c \in [-73.1, -67.6]$, and $d \in [21, 28]$

E. $a \in [45, 55], b \in [-130, -126], c \in [109, 113]$, and $d \in [-24, -21]$

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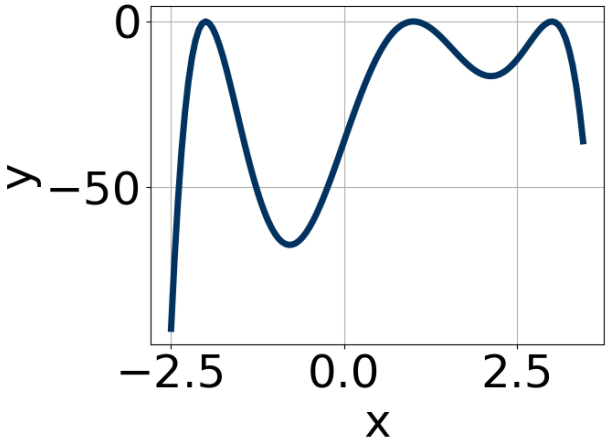
10. Which of the following equations *could* be of the graph presented below?



A. $13(x-1)^4(x+2)^4(x-3)^{10}$

B. $-11(x-1)^6(x+2)^{10}(x-3)^4$

C. $-13(x-1)^{10}(x+2)^4(x-3)^7$

D. $9(x-1)^{10}(x+2)^{10}(x-3)^9$

E. $-13(x-1)^6(x+2)^5(x-3)^{11}$
