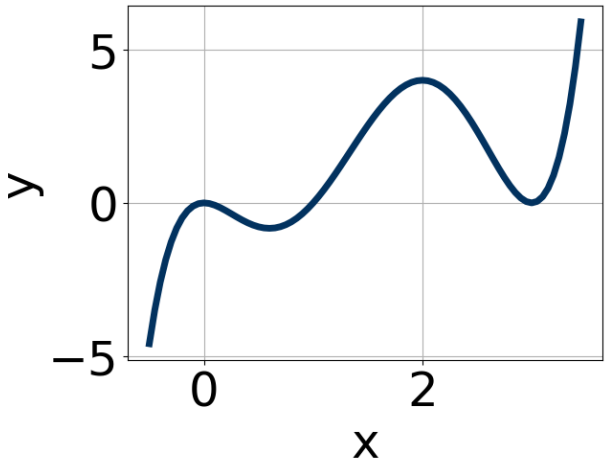
1. Which of the following equations *could* be of the graph presented below?



A. $12x^5(x-3)^6(x-1)^8$

B. $3x^{10}(x-3)^{10}(x-1)^7$

C. $-16x^6(x-3)^6(x-1)^6$

D. $10x^7(x-3)^8(x-1)^9$

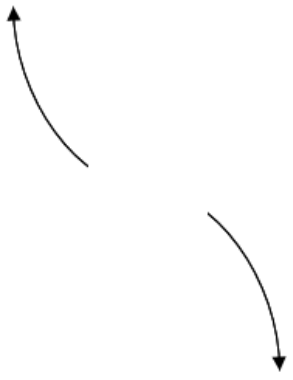
E. $-4x^4(x-3)^6(x-1)^9$

---

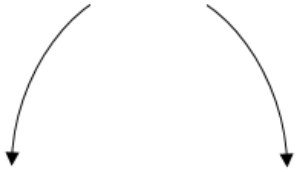
2. Describe the end behavior of the polynomial below.

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

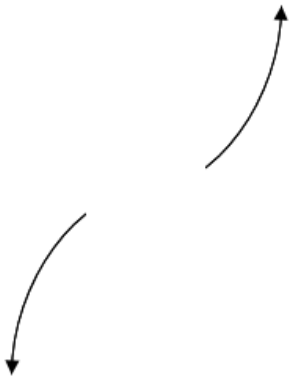
A.



B.



C.

D. 

E. None of the above.

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

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

A. $a \in [9, 13], b \in [-20, -16], c \in [-42, -33],$ and $d \in [-19, -12]$

B. $a \in [9, 13], b \in [9, 17], c \in [-51, -46],$ and $d \in [13, 22]$

C. $a \in [9, 13], b \in [-20, -16], c \in [-42, -33],$ and $d \in [13, 22]$

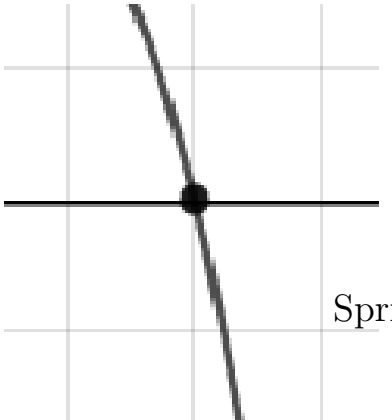
D. $a \in [9, 13], b \in [-50, -48], c \in [63, 65],$ and $d \in [-19, -12]$

E. $a \in [9, 13], b \in [19, 25], c \in [-42, -33],$ and $d \in [-19, -12]$

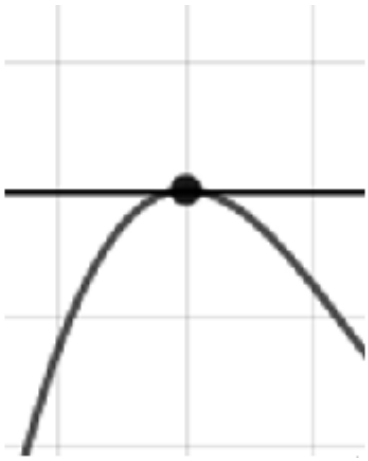
---

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

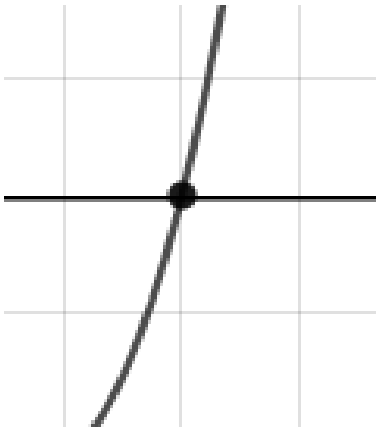
$$f(x) = -4(x + 8)^5(x - 8)^{10}(x + 2)^8(x - 2)^{12}$$



A

B. 

C. 

D. 

E. None of the above.

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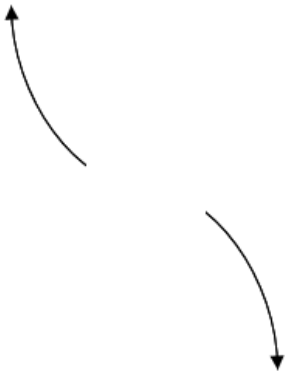
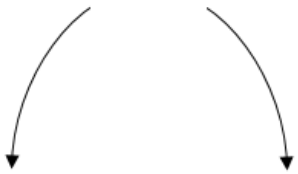
5. Describe the end behavior of the polynomial below.

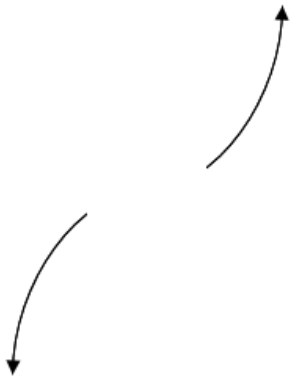
$$f(x) = -2(x-4)^5(x+4)^8(x+6)^5(x-6)^5$$

A. 

B. 

C.

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

$$4 - 5i \text{ and } 2$$

A. $b \in [-5, 5], c \in [-5, 4],$ and $d \in [-10, -7]$

B. $b \in [-11, -4], c \in [54, 62],$ and $d \in [-87, -81]$

C. $b \in [-5, 5], c \in [-10, 1],$ and $d \in [7, 9]$

D. $b \in [9, 17], c \in [54, 62],$ and $d \in [79, 83]$

E. None of the above.

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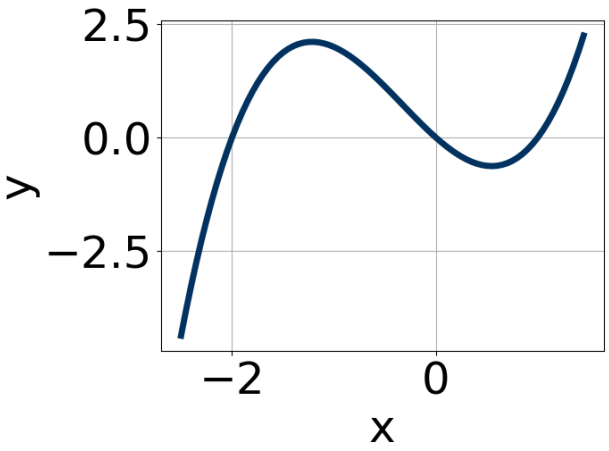
7. Which of the following equations *could* be of the graph presented below?



A. $-13x^{11}(x-1)^7(x+2)^5$

B. $13x^9(x-1)^8(x+2)^9$

C. $13x^{11}(x-1)^{11}(x+2)^9$

D. $-18x^7(x-1)^8(x+2)^7$

E. $18x^4(x-1)^{10}(x+2)^{11}$

---

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

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

A. $b \in [-4.9, -0.1], c \in [9, 18],$ and $d \in [134, 142]$

B. $b \in [-0.2, 1.3], c \in [-1, 9],$ and $d \in [-14, -5]$

C. $b \in [1.2, 8], c \in [9, 18],$ and $d \in [-137, -135]$

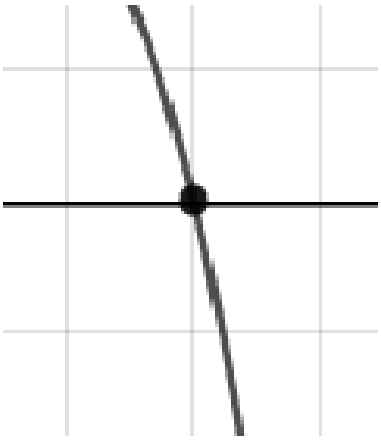
D. $b \in [-0.2, 1.3], c \in [-14, -8],$ and $d \in [20, 25]$

E. None of the above.

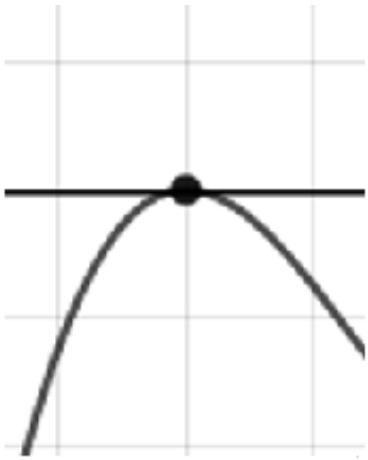
---

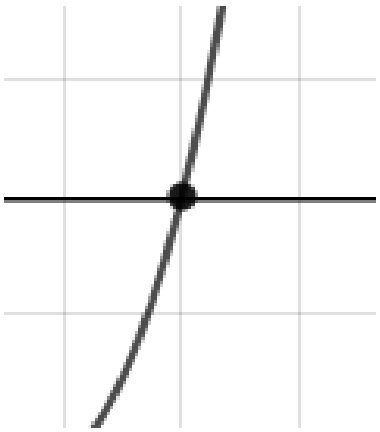
9. Describe the zero behavior of the zero $x = -3$ of the polynomial below.

$$f(x) = -9(x-3)^4(x+3)^5(x-8)^4(x+8)^8$$

A. 

C. 

B. 

D. 

E. None of the above.

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

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

A. $a \in [31, 37], b \in [51, 53], c \in [-96, -85],$ and $d \in [27, 44]$

B. $a \in [31, 37], b \in [-55, -44], c \in [-96, -85],$ and $d \in [27, 44]$

C. $a \in [31, 37], b \in [51, 53], c \in [-96, -85],$ and $d \in [-41, -27]$

D. $a \in [31, 37], b \in [117, 121], c \in [62, 71],$ and $d \in [-41, -27]$

E. $a \in [31, 37], b \in [140, 143], c \in [142, 157],$ and $d \in [27, 44]$
