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

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

A. $a \in [1, 9], b \in [-19, -12], c \in [36, 42],$ and $d \in [-22, -19]$

B. $a \in [1, 9], b \in [-12, 4], c \in [-23, -22],$ and $d \in [21, 28]$

C. $a \in [1, 9], b \in [5, 11], c \in [-20, -16],$ and $d \in [-22, -19]$

D. $a \in [1, 9], b \in [-19, -12], c \in [36, 42],$ and $d \in [21, 28]$

E. $a \in [1, 9], b \in [9, 25], c \in [36, 42],$ and $d \in [21, 28]$

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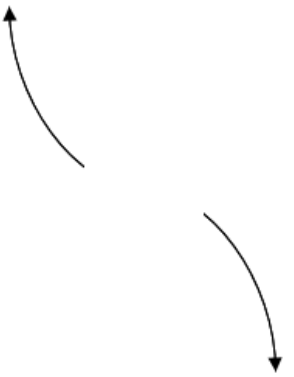
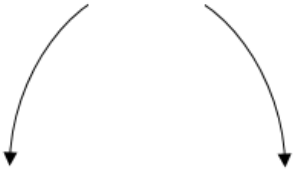
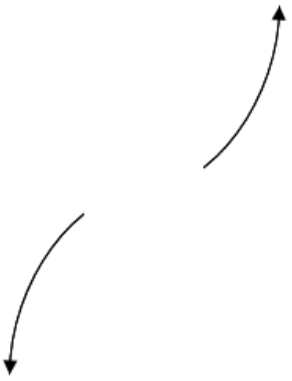
2. Describe the end behavior of the polynomial below.

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

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

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

A. $b \in [-7.2, -5.5], c \in [6.8, 10.2],$ and $d \in [48.9, 50.9]$

B. $b \in [-0.8, 2.4], c \in [1.5, 2.3],$ and $d \in [-8.1, -6.2]$

C. $b \in [-0.8, 2.4], c \in [-0.7, 1.3],$ and $d \in [-7.9, -5.2]$

D. $b \in [2.7, 8.3], c \in [6.8, 10.2],$ and $d \in [-53.6, -47.8]$

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

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

A. $a \in [35, 45], b \in [129, 138], c \in [152, 162],$ and $d \in [53, 59]$

B. $a \in [35, 45], b \in [9, 14], c \in [-96, -83],$ and $d \in [-56, -51]$

C. $a \in [35, 45], b \in [83, 91], c \in [10, 14],$ and $d \in [-56, -51]$

D. $a \in [35, 45], b \in [-10, 0], c \in [-96, -83],$ and $d \in [53, 59]$

E. $a \in [35, 45], b \in [9, 14], c \in [-96, -83],$ and $d \in [53, 59]$

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

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

A. $b \in [-8, 0], c \in [5.4, 8.1],$ and $d \in [35, 43]$

B. $b \in [2, 8], c \in [5.4, 8.1],$ and $d \in [-39, -29]$

C. $b \in [1, 2], c \in [-2.7, 2.2],$ and $d \in [-8, -2]$

D. $b \in [1, 2], c \in [4.6, 5.1],$ and $d \in [4, 8]$

E. None of the above.

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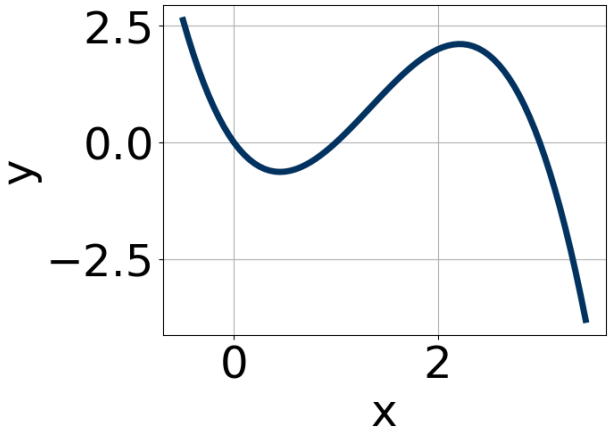
6. Which of the following equations *could* be of the graph presented below?



A. $-11x^4(x-3)^6(x-1)^7$

B. $-17x^5(x-3)^{11}(x-1)^{11}$

C. $8x^{10}(x-3)^9(x-1)^5$

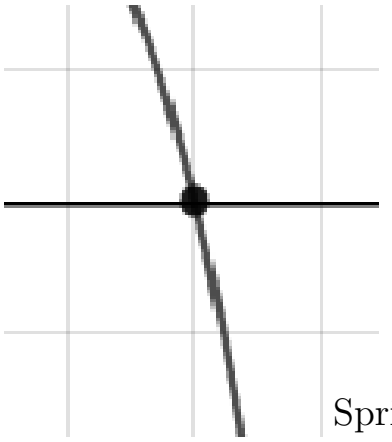
D. $20x^5(x-3)^{11}(x-1)^9$

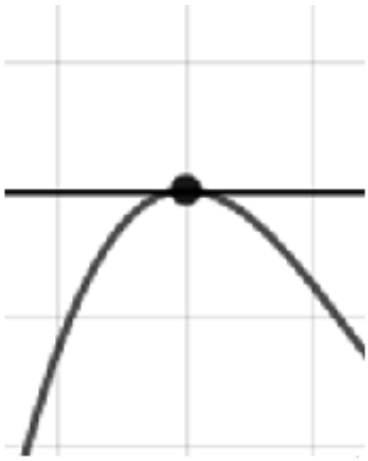
E. $-10x^8(x-3)^5(x-1)^5$

---

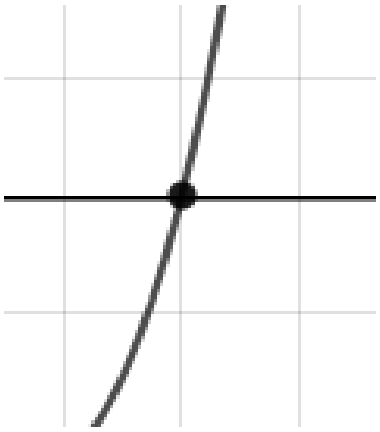
7. Describe the zero behavior of the zero $x = 8$ of the polynomial below.

$$f(x) = -8(x+3)^{12}(x-3)^8(x+8)^6(x-8)^3$$

A. 

B. 

C. 

D. 

E. None of the above.

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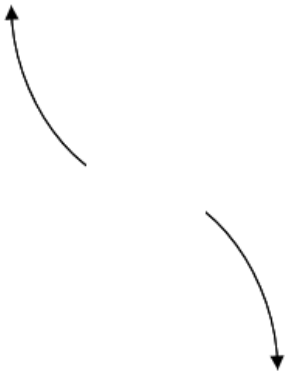
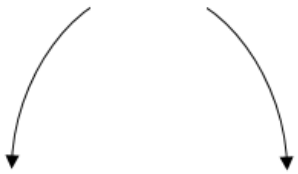
8. Describe the end behavior of the polynomial below.

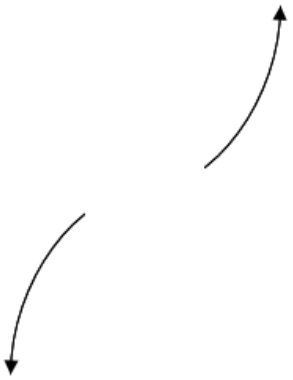
$$f(x) = -3(x+3)^2(x-3)^3(x+2)^5(x-2)^7$$

A. 

B. 

C.

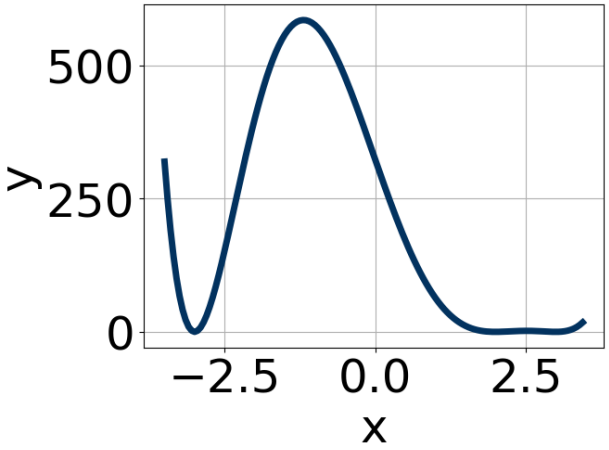
D.



E. None of the above.

---

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



A. $17(x+3)^{10}(x-3)^{6}(x-2)^{8}$

B. $-18(x+3)^{10}(x-3)^{10}(x-2)^{11}$

C. $-18(x+3)^{10}(x-3)^{4}(x-2)^{4}$

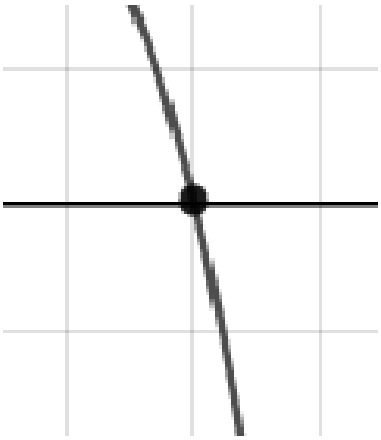
D. $10(x+3)^{4}(x-3)^{7}(x-2)^{5}$

E. $4(x+3)^{4}(x-3)^{4}(x-2)^{5}$

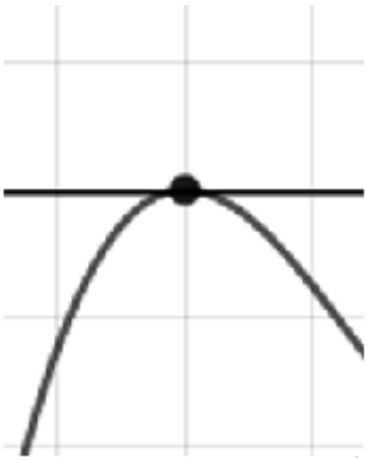
---

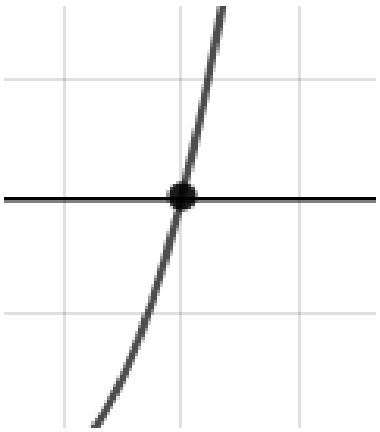
10. Describe the zero behavior of the zero $x = 4$ of the polynomial below.

$$f(x) = 4(x+9)^{4}(x-9)^{2}(x+4)^{13}(x-4)^{8}$$

A. 

C. 

B. 

D. 

E. None of the above.