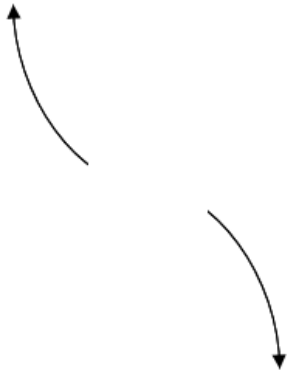
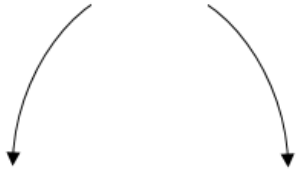
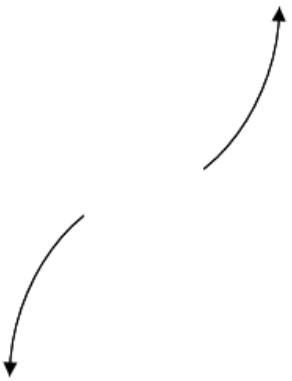
1. Describe the end behavior of the polynomial below.

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

A.


B.


C.


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

$$\frac{-3}{2}, \frac{1}{5}, \text{ and } 6$$

A. $a \in [6, 11], b \in [47, 50], c \in [-83, -76],$ and $d \in [-21, -15]$

B. $a \in [6, 11], b \in [-55, -41], c \in [-83, -76],$ and $d \in [-21, -15]$

C. $a \in [6, 11], b \in [-55, -41], c \in [-83, -76],$ and $d \in [16, 25]$

D. $a \in [6, 11], b \in [-74, -70], c \in [75, 80],$ and $d \in [16, 25]$

E. $a \in [6, 11], b \in [-80, -75], c \in [101, 114],$ and $d \in [-21, -15]$

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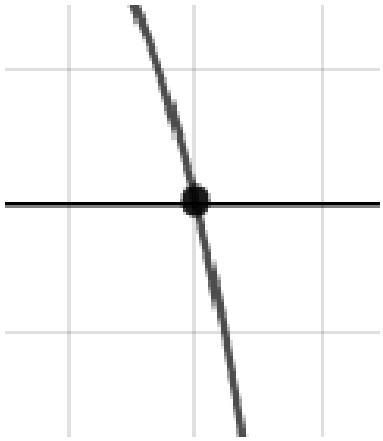
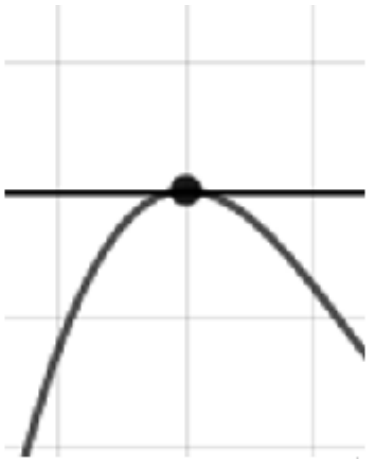
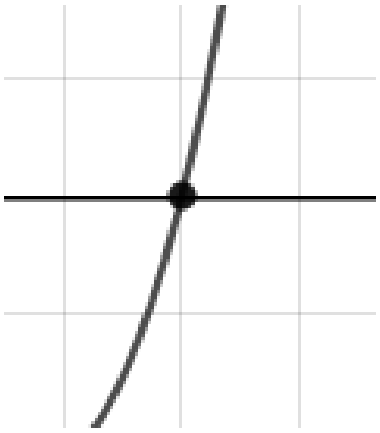
3. Describe the zero behavior of the zero $x = -4$ of the polynomial below.

$$f(x) = 6(x-4)^9(x+4)^{12}(x+8)^3(x-8)^5$$

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

$$5 - 2i \text{ and } 3$$

A. $b \in [-16, -12], c \in [59, 62],$ and $d \in [-89, -75]$

B. $b \in [-3, 6], c \in [-13, -5],$ and $d \in [14, 20]$

C. $b \in [-3, 6], c \in [-4, 0],$ and $d \in [-9, 1]$

D. $b \in [10, 20], c \in [59, 62],$ and $d \in [84, 92]$

E. None of the above.

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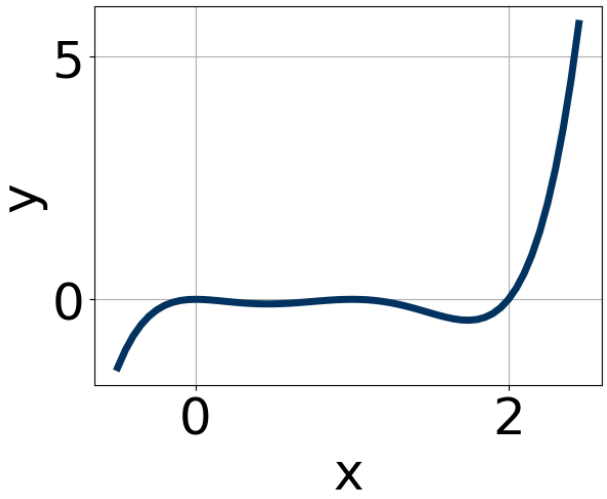
5. Which of the following equations *could* be of the graph presented below?



A. $10x^4(x-1)^{11}(x-2)^5$

B. $10x^4(x-1)^8(x-2)^9$

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

D. $-16x^6(x-1)^{10}(x-2)^7$

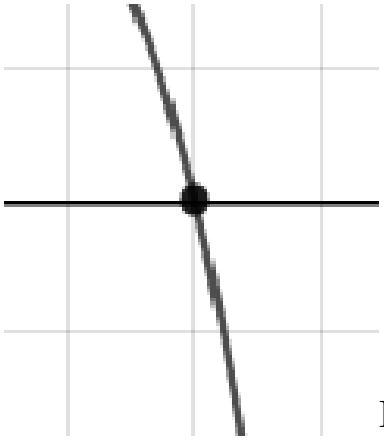
E. $10x^{10}(x-1)^7(x-2)^4$

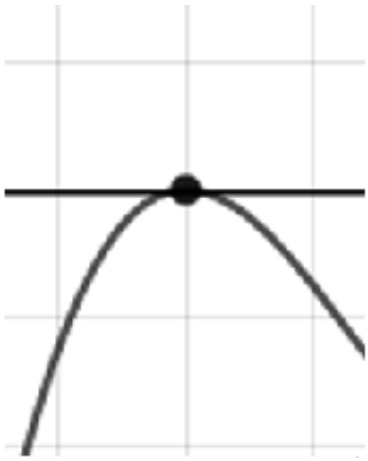
---

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

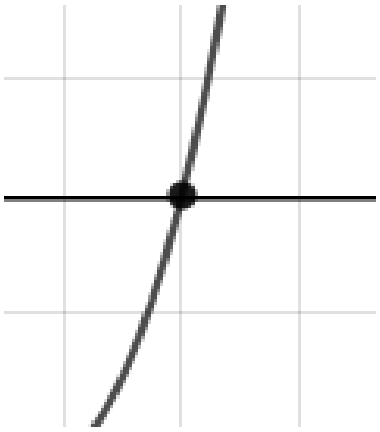
$$f(x) = 6(x-5)^8(x+5)^9(x-9)^2(x+9)^6$$

A.



B. 

C. 

D. 

E. None of the above.

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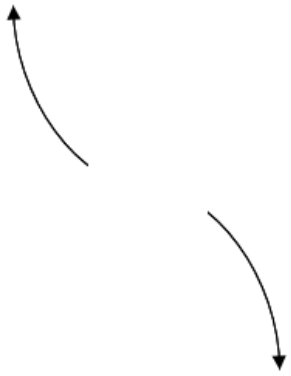
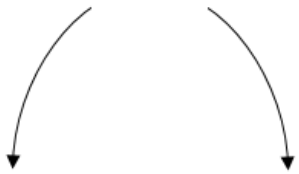
7. Describe the end behavior of the polynomial below.

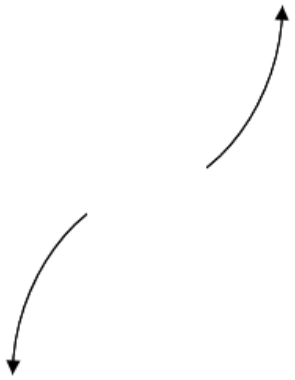
$$f(x) = -9(x-9)^3(x+9)^4(x-8)^5(x+8)^6$$

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

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

A. $b \in [7, 12], c \in [33.6, 38.7],$ and $d \in [78, 88]$

B. $b \in [-8, -3], c \in [33.6, 38.7],$ and $d \in [-82, -75]$

C. $b \in [-2, 6], c \in [4.5, 7.9],$ and $d \in [3, 9]$

D. $b \in [-2, 6], c \in [6.8, 9.4],$ and $d \in [12, 24]$

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

$$\frac{7}{5}, \frac{-4}{5}, \text{ and } \frac{1}{2}$$

A. $a \in [50, 51], b \in [-63, -50], c \in [-43, -33],$ and $d \in [-32, -26]$

B. $a \in [50, 51], b \in [51, 56], c \in [-43, -33],$ and $d \in [-32, -26]$

C. $a \in [50, 51], b \in [80, 86], c \in [-2, 3],$ and $d \in [-32, -26]$

D. $a \in [50, 51], b \in [-63, -50], c \in [-43, -33],$ and $d \in [24, 36]$

E. $a \in [50, 51], b \in [4, 8], c \in [-73, -67],$ and $d \in [24, 36]$

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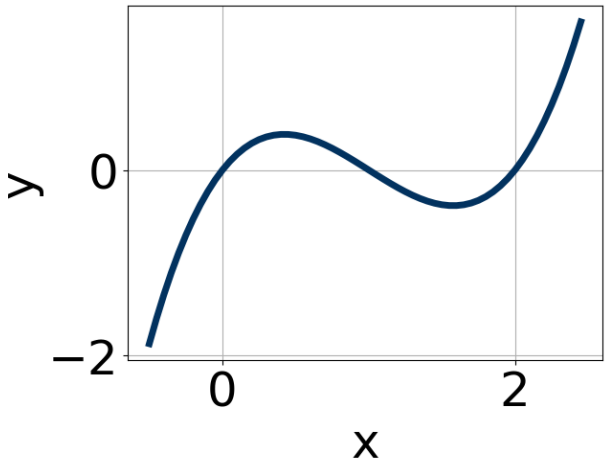
10. Which of the following equations *could* be of the graph presented below?



A. $15x^7(x-1)^{11}(x-2)^{11}$

B. $-13x^7(x-1)^9(x-2)^7$

C. $19x^7(x-1)^8(x-2)^6$

D. $-15x^5(x-1)^8(x-2)^7$

E. $7x^{11}(x-1)^6(x-2)^9$
