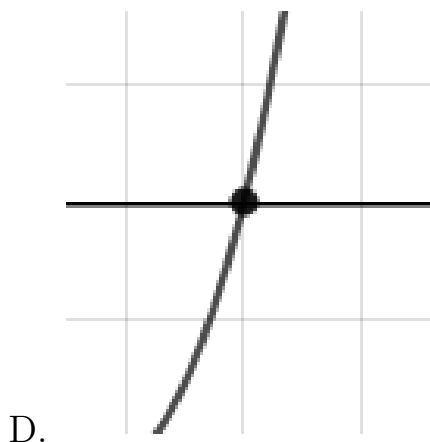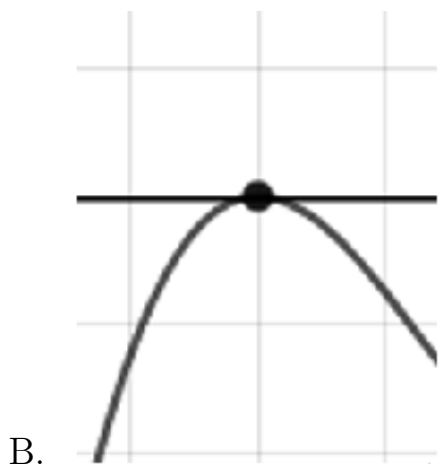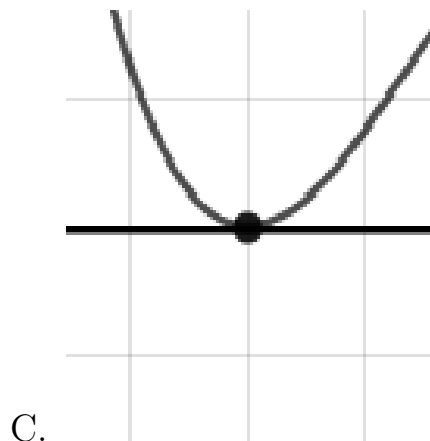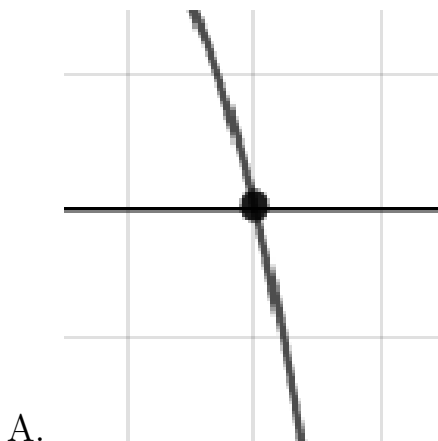1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

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

A. $a \in [5, 11], b \in [34, 42], c \in [-24, -15], \text{ and } d \in [-99, -85]$

B. $a \in [5, 11], b \in [14, 18], c \in [-103, -96], \text{ and } d \in [-99, -85]$

C. $a \in [5, 11], b \in [-22, -16], c \in [-103, -96], \text{ and } d \in [-99, -85]$

D. $a \in [5, 11], b \in [-41, -32], c \in [-11, -3], \text{ and } d \in [87, 95]$

E. $a \in [5, 11], b \in [14, 18], c \in [-103, -96], \text{ and } d \in [87, 95]$

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

$$f(x) = 6(x - 6)^{10}(x + 6)^9(x + 3)^{12}(x - 3)^7$$

A.

C.

B.

D.

    E. None of the above.

---

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

$$6, 4, \text{ and } \frac{5}{4}$$

  A. $a \in [4, 8], b \in [-48, -38], c \in [139, 147], \text{ and } d \in [-122, -114]$

  B. $a \in [4, 8], b \in [-1, 4], c \in [-110, -99], \text{ and } d \in [117, 124]$

  C. $a \in [4, 8], b \in [-48, -38], c \in [139, 147], \text{ and } d \in [117, 124]$

  D. $a \in [4, 8], b \in [45, 46], c \in [139, 147], \text{ and } d \in [117, 124]$

  E. $a \in [4, 8], b \in [29, 37], c \in [42, 52], \text{ and } d \in [-122, -114]$

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

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

  A. $b \in [0, 1.3], c \in [-8, -4], \text{ and } d \in [1, 15]$

  B. $b \in [0, 1.3], c \in [0, 4], \text{ and } d \in [-15, -3]$

  C. $b \in [-7.3, -2], c \in [12, 25], \text{ and } d \in [64, 74]$

  D. $b \in [4.2, 7.3], c \in [12, 25], \text{ and } d \in [-64, -61]$

  E. None of the above.

---

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

$$-2 - 5i \text{ and } 4$$
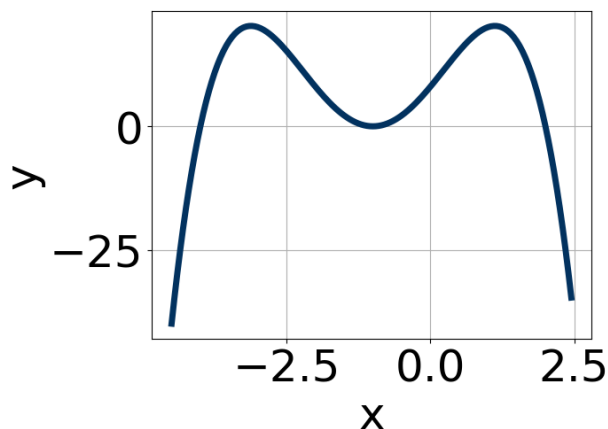
A. $b \in [-1.34, 0.32]$, $c \in [12.8, 14.7]$, and $d \in [113, 118]$

B. $b \in [0.71, 1.99]$, $c \in [-2.2, -0.1]$, and $d \in [-13, -3]$

C. $b \in [-1.34, 0.32]$, $c \in [12.8, 14.7]$, and $d \in [-121, -114]$

D. $b \in [0.71, 1.99]$, $c \in [-1.7, 1.2]$, and $d \in [-24, -19]$

E. None of the above.

6. Which of the following equations *could* be of the graph presented below?
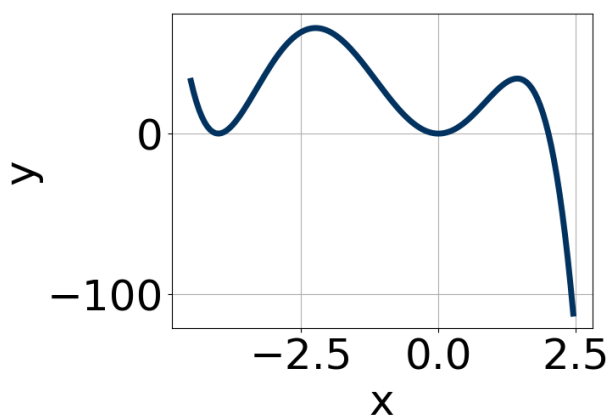
A. $9x^6(x+4)^4(x-2)^5$

B. $-17x^{10}(x+4)^8(x-2)^9$

C. $-9x^{10}(x+4)^7(x-2)^4$

D. $5x^{10}(x+4)^8(x-2)^6$

E. $-10x^{10}(x+4)^7(x-2)^9$

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

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

B. $-16(x+1)^6(x+4)^6(x-2)^5$

C. $12(x+1)^4(x+4)^9(x-2)^7$

D. $5(x+1)^8(x+4)^5(x-2)^{10}$

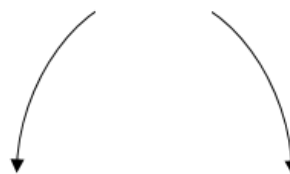E. $-16(x+1)^4(x+4)^9(x-2)^9$

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8. Describe the end behavior of the polynomial below.
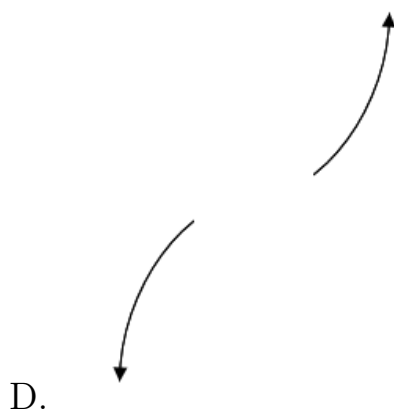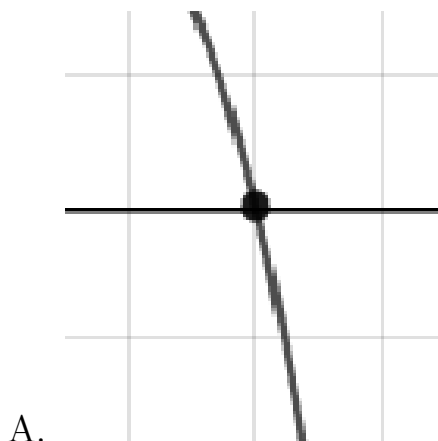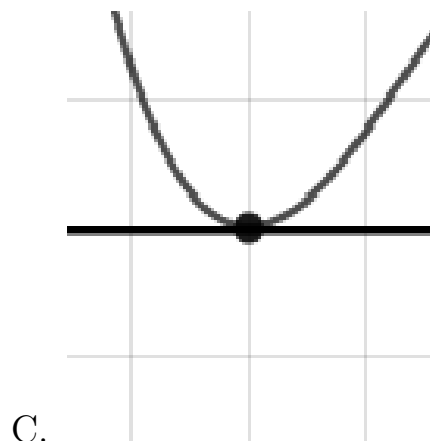
$$f(x) = -4(x-4)^2(x+4)^7(x-7)^3(x+7)^4$$

B.

A.

C.

D.
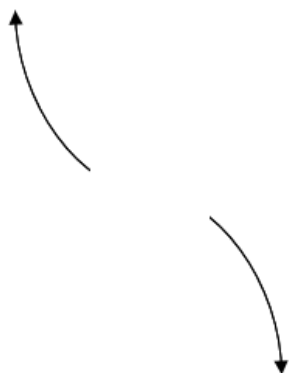
E. None of the above.

9. Describe the zero behavior of the zero $x = -3$ of the polynomial below.
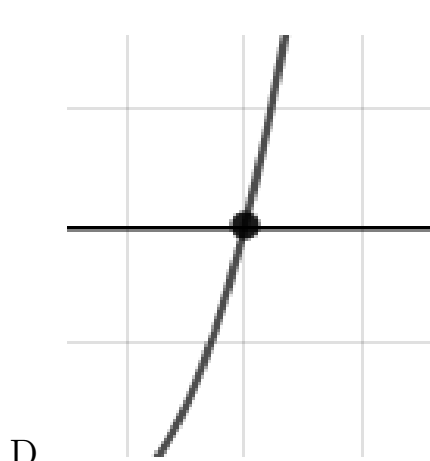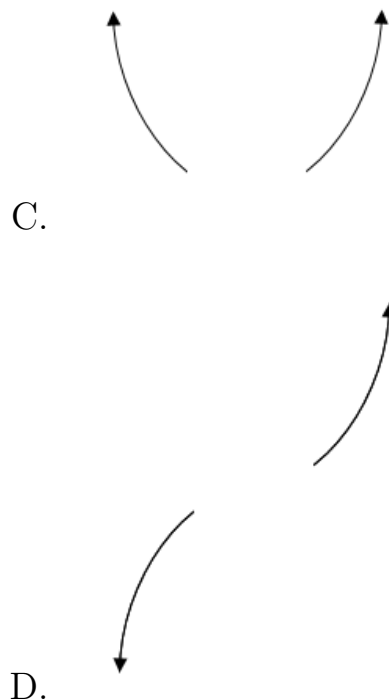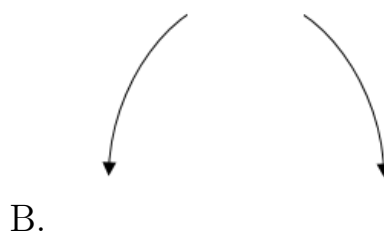
$$f(x) = 7(x-3)^9(x+3)^{10}(x+4)^9(x-4)^{13}$$
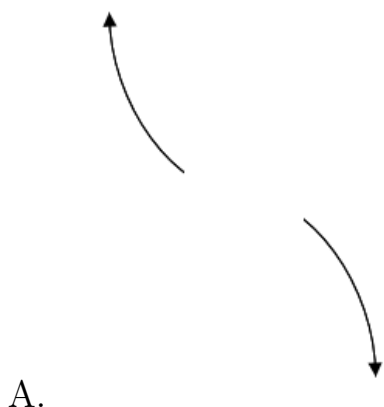
A.

C.

B.

D.
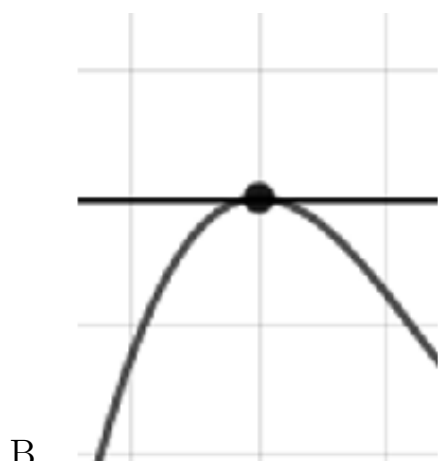
E. None of the above.

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10. Describe the end behavior of the polynomial below.

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

A.

B.

C.

D.

E. None of the above.