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

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

A. $b \in [-13, -2], c \in [40, 42.8], \text{ and } d \in [-90, -77]$

B. $b \in [-3, 2], c \in [3.1, 6.1], \text{ and } d \in [-1, 8]$

C. $b \in [6, 10], c \in [40, 42.8], \text{ and } d \in [84, 96]$

D. $b \in [-3, 2], c \in [5.5, 10.3], \text{ and } d \in [13, 21]$

E. None of the above.

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

$$\frac{-3}{2}, \frac{-5}{4}, \text{ and } \frac{7}{4}$$

A. $a \in [26, 33], b \in [-38, -30], c \in [-101, -92], \text{ and } d \in [105, 110]$

B. $a \in [26, 33], b \in [32, 36], c \in [-101, -92], \text{ and } d \in [-111, -104]$

C. $a \in [26, 33], b \in [32, 36], c \in [-101, -92], \text{ and } d \in [105, 110]$

D. $a \in [26, 33], b \in [-144, -138], c \in [207, 217], \text{ and } d \in [-111, -104]$

E. $a \in [26, 33], b \in [-72, -58], c \in [-56, -45], \text{ and } d \in [105, 110]$

3. Which of the following equations *could* be of the graph presented below?
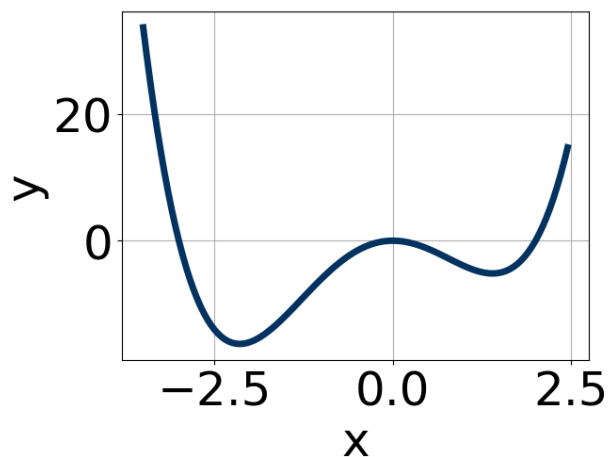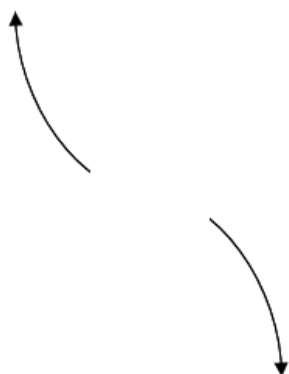
A. $-13x^6(x+3)^7(x-2)^{10}$

B. $12x^{10}(x+3)^9(x-2)^{11}$

C. $-3x^6(x+3)^5(x-2)^5$
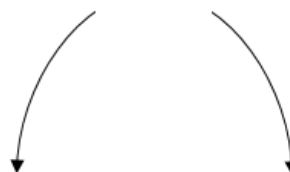
D. $15x^7(x+3)^{10}(x-2)^5$

E. $19x^{10}(x+3)^8(x-2)^9$

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4. Describe the end behavior of the polynomial below.

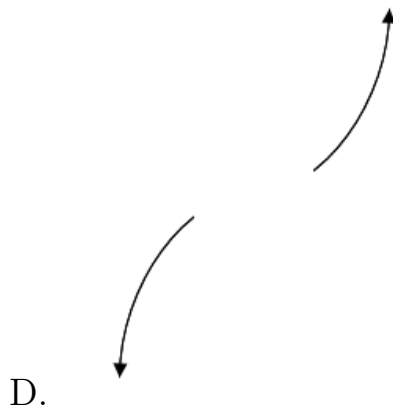$$f(x) = 7(x-9)^5(x+9)^8(x+2)^4(x-2)^4$$
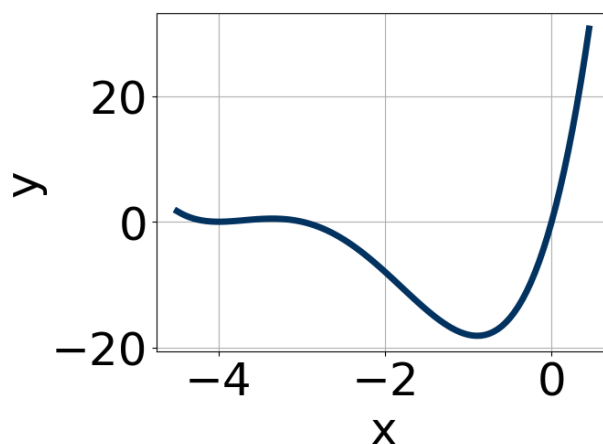

A.

B.

C.

D.

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

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

A. $a \in [3,5], b \in [-28.7, -25.9], c \in [42, 48], \text{ and } d \in [41, 44]$

B. $a \in [3,5], b \in [13.4, 15.1], c \in [-56, -54], \text{ and } d \in [-42, -41]$

C. $a \in [3,5], b \in [6.1, 12.1], c \in [-75, -70], \text{ and } d \in [41, 44]$

D. $a \in [3,5], b \in [27.6, 30.4], c \in [42, 48], \text{ and } d \in [-42, -41]$

E. $a \in [3,5], b \in [27.6, 30.4], c \in [42, 48], \text{ and } d \in [41, 44]$

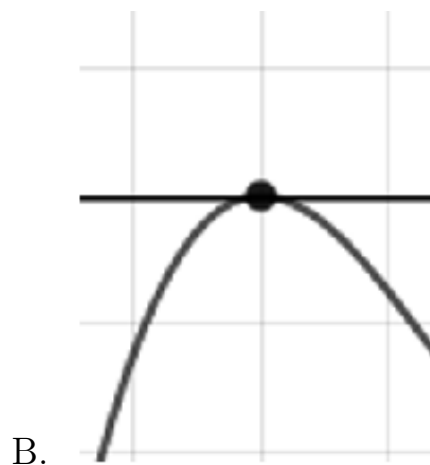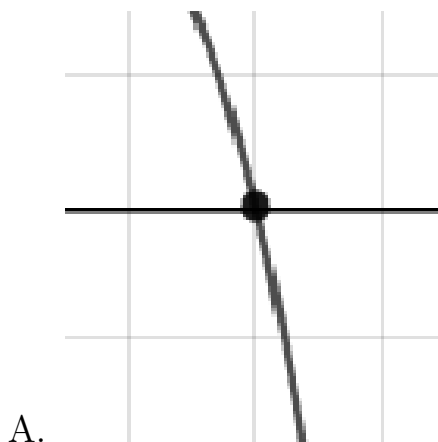
6. Which of the following equations *could* be of the graph presented below?

A. $-14x^5(x+4)^{10}(x+3)^{11}$

B. $-15x^6(x+4)^8(x+3)^5$

C. $18x^{11}(x+4)^4(x+3)^7$

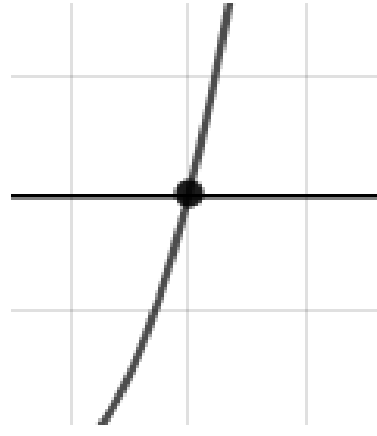D. $12x^{11}(x+4)^{10}(x+3)^{10}$

E. $5x^{11}(x+4)^9(x+3)^4$

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

$$f(x) = 3(x-7)^8(x+7)^{11}(x+5)^3(x-5)^4$$

A.

B.

C.   D.
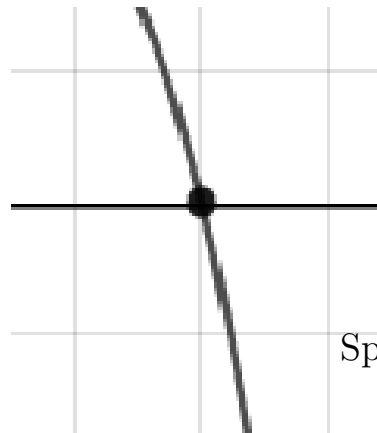
E. None of the above.

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

$$4 - 3i \text{ and } 1$$

A. $b \in [-4, 3], c \in [1, 7],$ and $d \in [-6, -1]$

B. $b \in [-4, 3], c \in [-11, -3],$ and $d \in [1, 6]$

C. $b \in [-10, -7], c \in [31, 38],$ and $d \in [-25, -20]$

D. $b \in [3, 13], c \in [31, 38],$ and $d \in [14, 32]$

E. None of the above.

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

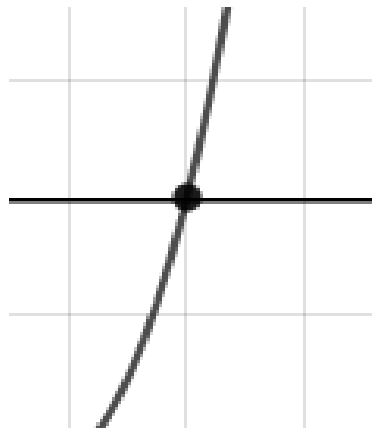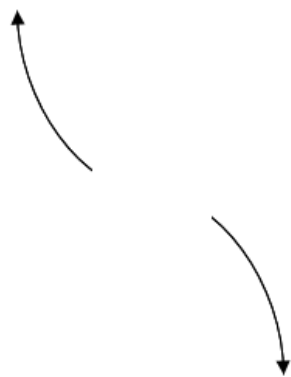$$f(x) = -8(x - 5)^{10}(x + 5)^8(x - 7)^{11}(x + 7)^6$$

A.

B.

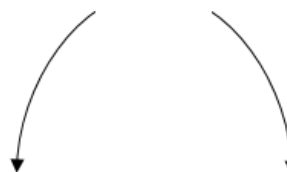

C.

D.

E. None of the above.

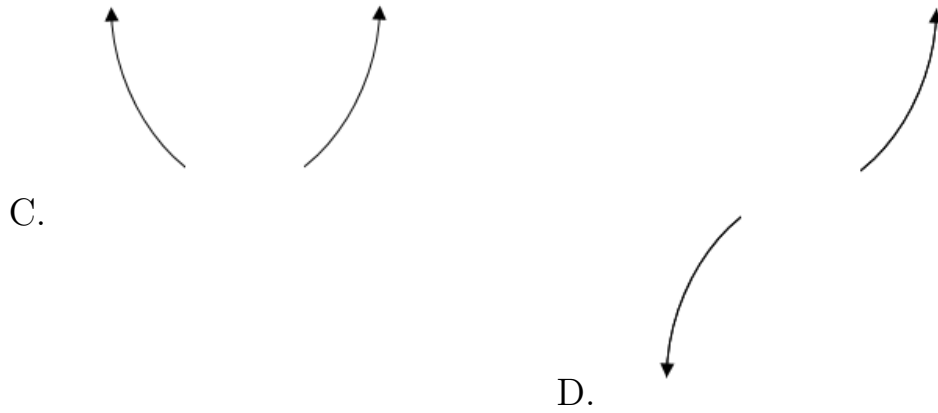10. Describe the end behavior of the polynomial below.

$$f(x) = 8(x + 6)^5(x - 6)^{10}(x + 8)^2(x - 8)^2$$

B.

A.

C.

D.

E. None of the above.