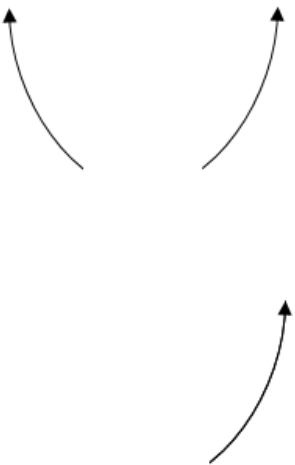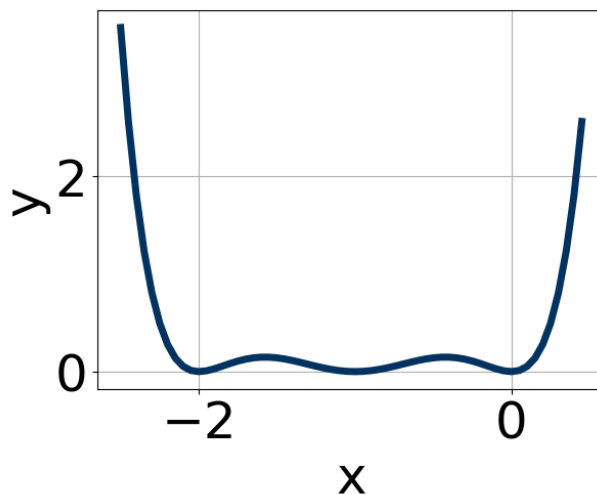1. Describe the end behavior of the polynomial below.

$$f(x) = -6(x+4)^5(x-4)^{10}(x+8)^2(x-8)^2$$

C.

A.

B. D.

E. None of the above.

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

A. $-3x^4(x+1)^8(x+2)^7$

B. $3x^{10}(x+1)^9(x+2)^9$

C. $-10x^6(x+1)^6(x+2)^8$

D. $14x^8(x+1)^{10}(x+2)^5$

E. $18x^8(x+1)^8(x+2)^8$

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

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

A. $a \in [38, 42], b \in [-22.1, -20.7], c \in [-1.03, 0.65],$ and $d \in [0.99, 2.17]$

B. $a \in [38, 42], b \in [-6.3, -1.7], c \in [-8.44, -6.66],$ and $d \in [-2.34, -0.38]$

C. $a \in [38, 42], b \in [-18.8, -14.4], c \in [-4.18, -1.92],$ and $d \in [0.99, 2.17]$

D. $a \in [38, 42], b \in [19.4, 22.1], c \in [-1.03, 0.65],$ and $d \in [-2.34, -0.38]$

E. $a \in [38, 42], b \in [-22.1, -20.7], c \in [-1.03, 0.65],$ and $d \in [-2.34, -0.38]$

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

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

A. $a \in [48, 52], b \in [61, 71], c \in [-104, -99],$ and $d \in [-22, -14]$

B. $a \in [48, 52], b \in [83, 93], c \in [-72, -63],$ and $d \in [-22, -14]$

C. $a \in [48, 52], b \in [61, 71], c \in [-104, -99],$ and $d \in [19, 28]$

D. $a \in [48, 52], b \in [-65, -63], c \in [-104, -99],$ and $d \in [-22, -14]$

E. $a \in [48, 52], b \in [-144, -132], c \in [38, 50],$ and $d \in [19, 28]$

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

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

A. $b \in [-7, -4], c \in [18.23, 21.41]$, and $d \in [23.7, 26.32]$

B. $b \in [1, 3], c \in [-2.11, -1.71]$, and $d \in [-3.94, -2.28]$

C. $b \in [1, 3], c \in [-3.03, -2.44]$, and $d \in [-6.22, -3.95]$

D. $b \in [3, 17], c \in [18.23, 21.41]$, and $d \in [-25.16, -24.62]$

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

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

A. $b \in [-13, -6], c \in [30.93, 31.32]$, and $d \in [-42.1, -37.4]$

B. $b \in [-7, 3], c \in [5.16, 6.14]$, and $d \in [8.1, 9.3]$

C. $b \in [-7, 3], c \in [4.11, 5.57]$, and $d \in [3.2, 8.6]$

D. $b \in [7, 11], c \in [30.93, 31.32]$, and $d \in [38.3, 41.1]$

E. None of the above.

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

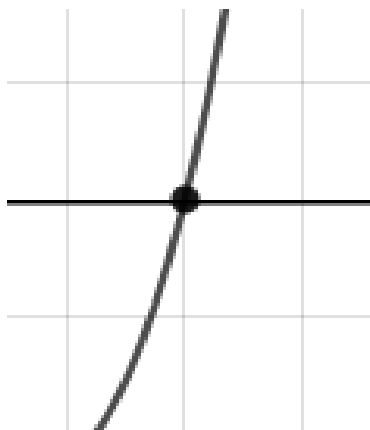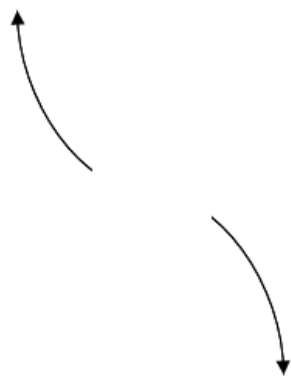$$f(x) = -7(x - 8)^4(x + 8)^3(x - 9)^{11}(x + 9)^8$$
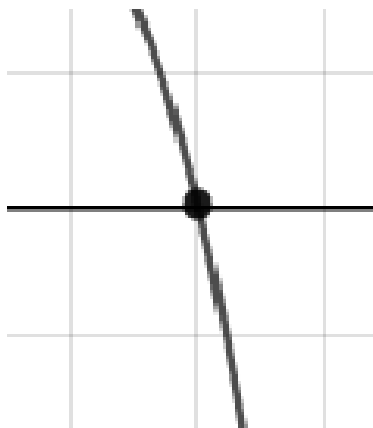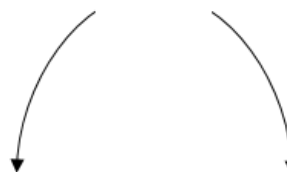
B.

C.

D.

E. None of the above.

8. Describe the end behavior of the polynomial below.
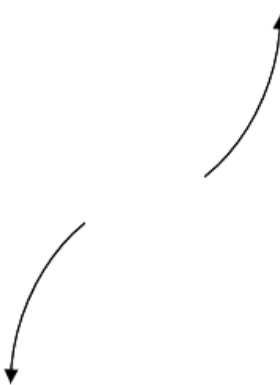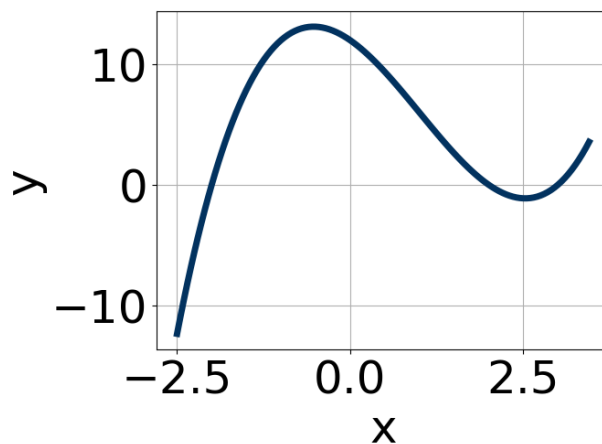
$$f(x) = 8(x-4)^5(x+4)^8(x+5)^2(x-5)^4$$
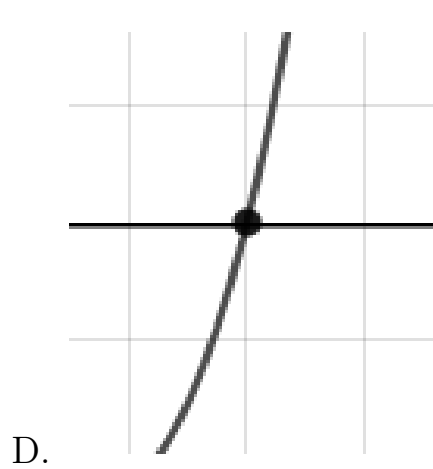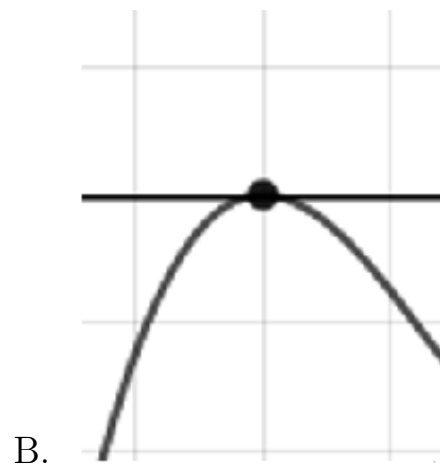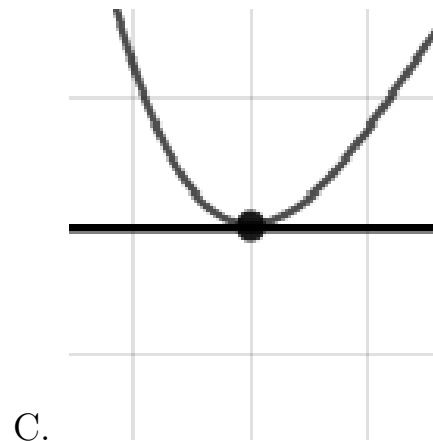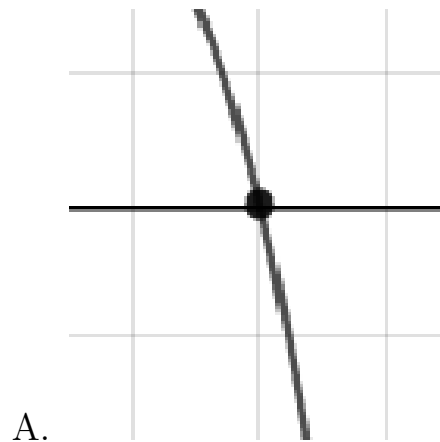
B.

A.

C.

D.

E. None of the above.

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

A. $-16(x-2)^8(x-3)^5(x+2)^7$

B. $-2(x-2)^7(x-3)^9(x+2)^7$

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

D. $6(x-2)^4(x-3)^5(x+2)^9$

E. $3(x-2)^{11}(x-3)^5(x+2)^{11}$

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

$$f(x) = -5(x+7)^9(x-7)^{14}(x-9)^5(x+9)^6$$

A.

C.

B.

D.

E. None of the above.