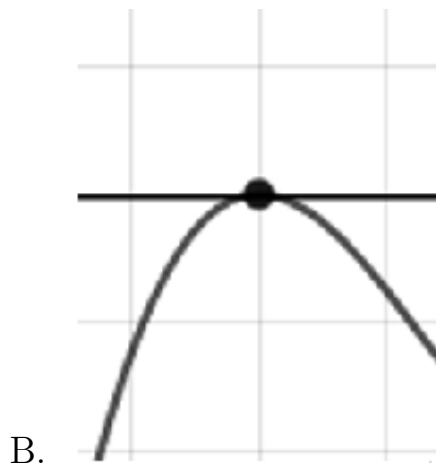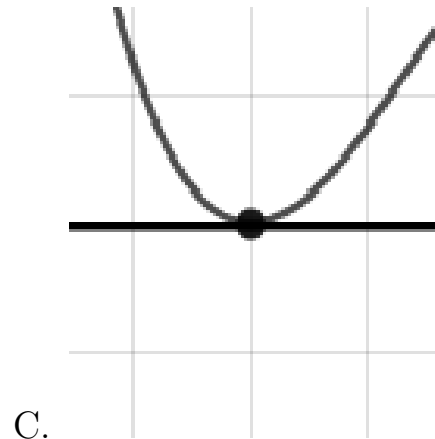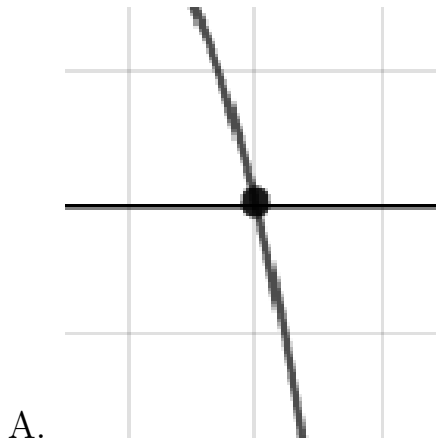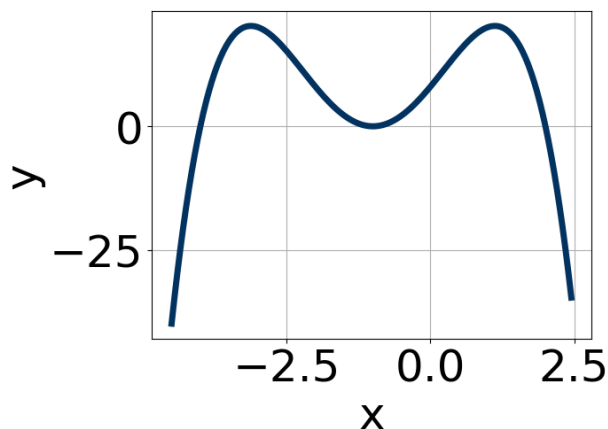1. Describe the zero behavior of the zero $x = 9$ of the polynomial below.

$$f(x) = 9(x + 5)^8(x - 5)^4(x - 9)^{11}(x + 9)^6$$

A.

C.

B.

D.
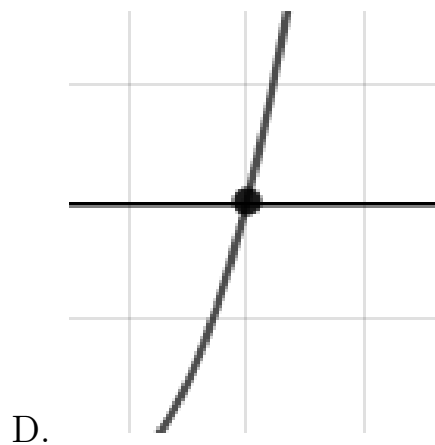
E. None of the above.

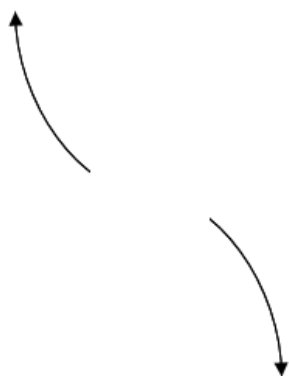2. Which of the following equations *could* be of the graph presented below?

A. $-2(x+1)^9(x+4)^8(x-2)^7$

B. $-10(x+1)^8(x+4)^8(x-2)^5$

C. $-13(x+1)^8(x+4)^5(x-2)^9$

D. $14(x+1)^4(x+4)^9(x-2)^4$

E. $13(x+1)^6(x+4)^9(x-2)^7$

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3. Describe the end behavior of the polynomial below.

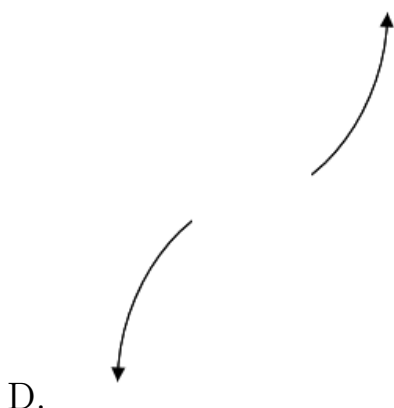$$f(x) = -4(x+3)^4(x-3)^5(x+8)^4(x-8)^5$$

B.

A.

C.

D.

E. None of the above.

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

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

A. $a \in [35, 48], b \in [6, 14], c \in [-180, -167],$ and $d \in [93, 104]$

B. $a \in [35, 48], b \in [-14, -6], c \in [-180, -167],$ and $d \in [-100, -90]$

C. $a \in [35, 48], b \in [-141, -136], c \in [30, 43],$ and $d \in [93, 104]$

D. $a \in [35, 48], b \in [71, 76], c \in [-126, -112],$ and $d \in [-100, -90]$

E. $a \in [35, 48], b \in [-14, -6], c \in [-180, -167],$ and $d \in [93, 104]$

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

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

A. $b \in [-6.9, -3.4], c \in [-9.6, -2.8],$ and $d \in [57, 63]$

B. $b \in [0.7, 1.6], c \in [-2.7, -0.1],$ and $d \in [-17, -7]$

C. $b \in [0.7, 1.6], c \in [0.2, 2.5],$ and $d \in [-7, -2]$

D. $b \in [3.6, 7.9], c \in [-9.6, -2.8],$ and $d \in [-67, -52]$

E. None of the above.