1. Describe the end behavior of the polynomial below.

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

C.

A.

B.   D.

E. None of the above.
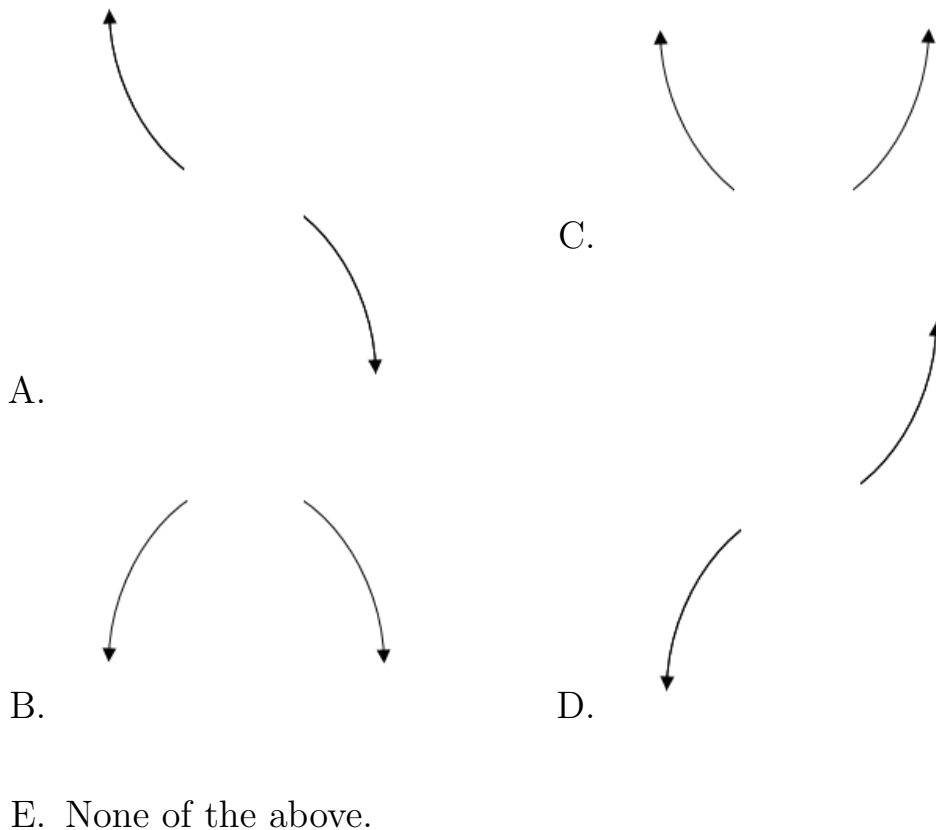
2. Which of the following equations *could* be of the graph presented below?
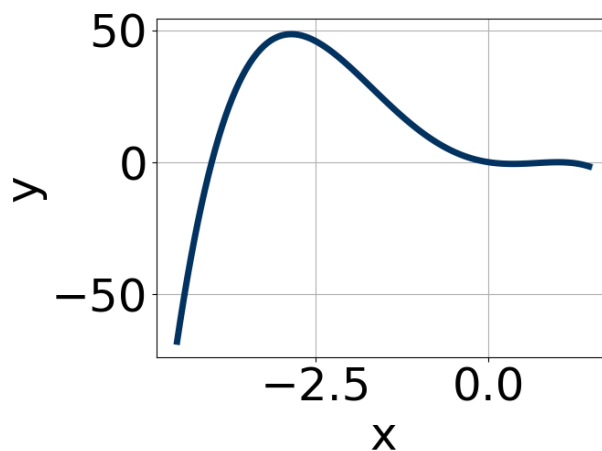
A. $-20x^8(x-1)^4(x+4)^5$

B. $14x^5(x-1)^4(x+4)^4$

C. $-7x^6(x-1)^5(x+4)^9$

D. $-3x^5(x-1)^6(x+4)^{11}$

E. $20x^7(x-1)^{10}(x+4)^{11}$

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

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

A. $a \in [8, 21], b \in [14, 22], c \in [-56, -48],$ and $d \in [21, 32]$

B. $a \in [8, 21], b \in [32, 42], c \in [-1, 9],$ and $d \in [-30, -24]$

C. $a \in [8, 21], b \in [45, 61], c \in [65, 76],$ and $d \in [21, 32]$

D. $a \in [8, 21], b \in [-17, -10], c \in [-56, -48],$ and $d \in [21, 32]$

E. $a \in [8, 21], b \in [-17, -10], c \in [-56, -48],$ and $d \in [-30, -24]$

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

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

A. $a \in [38, 47], b \in [-53, -46], c \in [-95, -81],$ and $d \in [75, 85]$

B. $a \in [38, 47], b \in [46, 59], c \in [-95, -81],$ and $d \in [-82, -72]$

C. $a \in [38, 47], b \in [46, 59], c \in [-95, -81],$ and $d \in [75, 85]$

D. $a \in [38, 47], b \in [96, 104], c \in [-8, 0],$ and $d \in [-82, -72]$

E. $a \in [38, 47], b \in [170, 174], c \in [208, 212],$ and $d \in [75, 85]$

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

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

A. $b \in [-3, 3], c \in [-7.24, -6.71]$, and $d \in [12, 18]$

B. $b \in [-17, -6], c \in [35.65, 38.84]$, and $d \in [-55, -51]$

C. $b \in [-3, 3], c \in [-6.62, -5.73]$, and $d \in [0, 11]$

D. $b \in [9, 11], c \in [35.65, 38.84]$, and $d \in [47, 55]$

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

$$-3 - 2i \text{ and } -1$$

A. $b \in [-1.4, 1.6], c \in [2.69, 3.9]$, and $d \in [0.87, 2.86]$

B. $b \in [-1.4, 1.6], c \in [3.53, 4.78]$, and $d \in [2.66, 3.65]$

C. $b \in [-7.8, -5.8], c \in [18.72, 19.42]$, and $d \in [-13.71, -12.62]$

D. $b \in [3.5, 10.6], c \in [18.72, 19.42]$, and $d \in [10, 13.23]$

E. None of the above.

7. Describe the zero behavior of the zero $x = -5$ of the polynomial below.
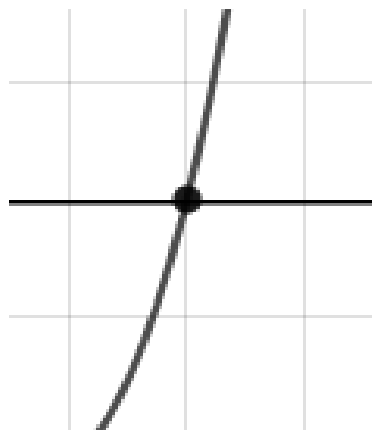
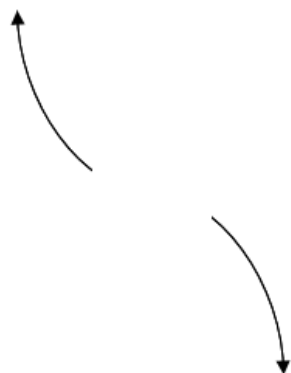$$f(x) = 4(x + 5)^6 (x - 5)^{11} (x - 6)^6 (x + 6)^9$$
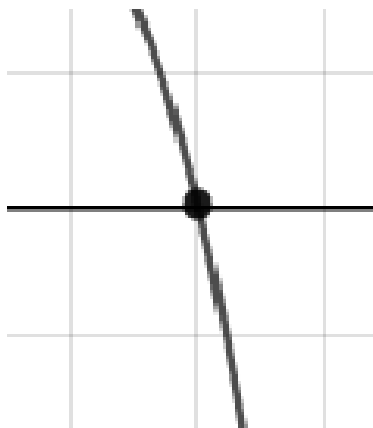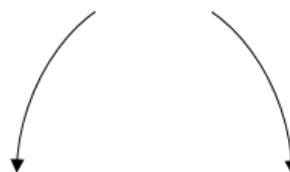
B.

C.

D.

E. None of the above.

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8. Describe the end behavior of the polynomial below.

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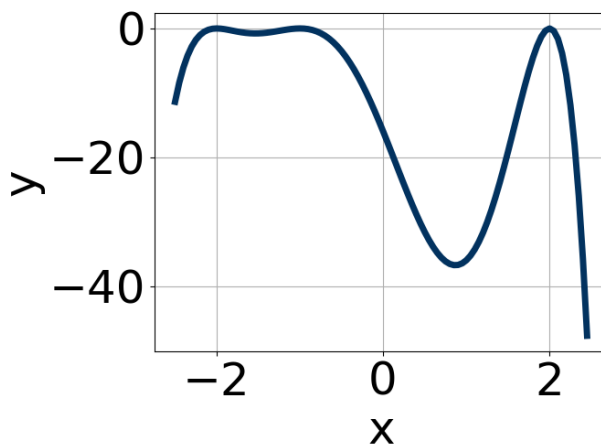
B.

A.

C.

D.

E. None of the above.

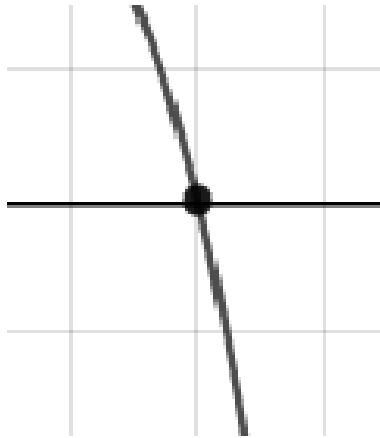9. Which of the following equations *could* be of the graph presented below?

A. $-3(x + 1)^{10}(x + 2)^8(x - 2)^{11}$

B. $-19(x + 1)^4(x + 2)^9(x - 2)^9$

C. $15(x + 1)^4(x + 2)^{10}(x - 2)^9$

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

E. $15(x + 1)^4(x + 2)^8(x - 2)^4$

10. Describe the zero behavior of the zero $x = 2$ of the polynomial below.
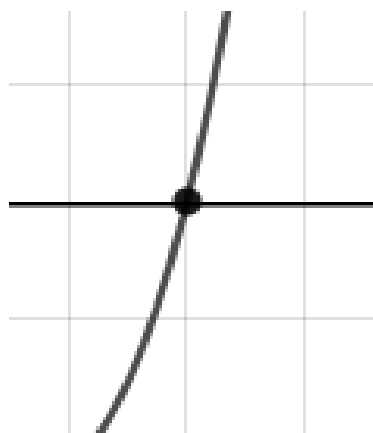
$$f(x) = 8(x - 7)^6(x + 7)^3(x - 2)^6(x + 2)^3$$

A.

C.

B.

D.

E. None of the above.