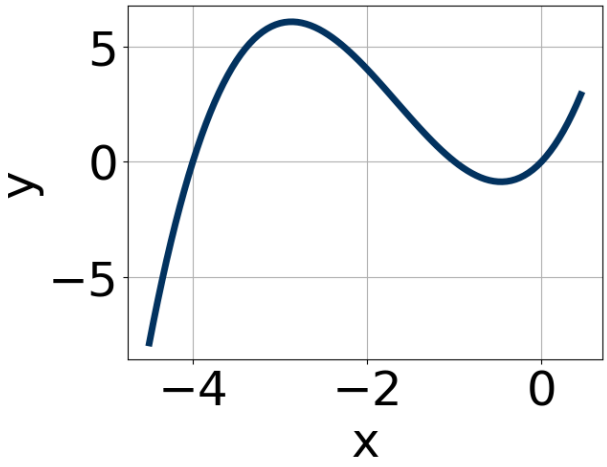
1. Which of the following equations *could* be of the graph presented below?



A. $11x^{11}(x+4)^7(x+1)^5$

B. $17x^6(x+4)^4(x+1)^9$

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

D. $-15x^6(x+4)^7(x+1)^{11}$

E. $-9x^9(x+4)^5(x+1)^5$

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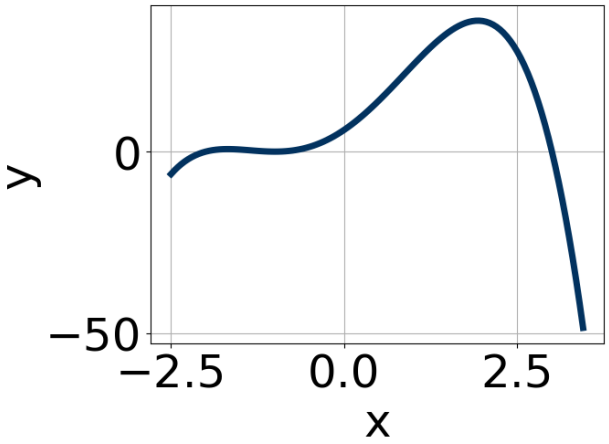
2. Which of the following equations *could* be of the graph presented below?



A. $-13(x+1)^8(x+2)^{10}(x-3)^9$

B. $11(x+1)^{10}(x+2)^9(x-3)^8$

C. $8(x+1)^6(x+2)^7(x-3)^5$

D. $-20(x+1)^7(x+2)^4(x-3)^5$

E. $-19(x+1)^4(x+2)^7(x-3)^7$

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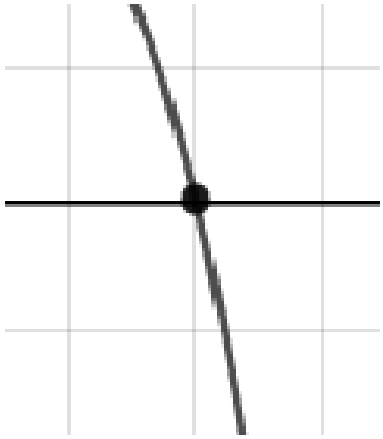
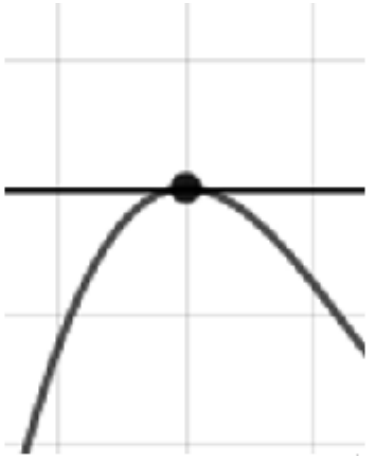
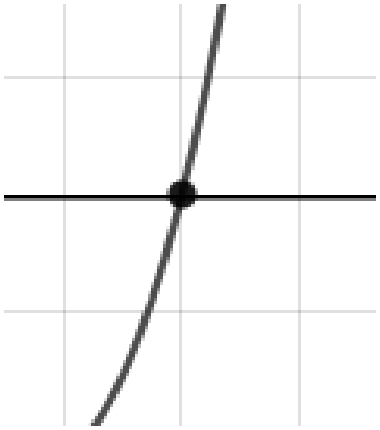
3. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = 4(x-8)^9(x+8)^{10}(x+6)^7(x-6)^{10}$$

A. 

C. 

B. 

D. 

E. None of the above.

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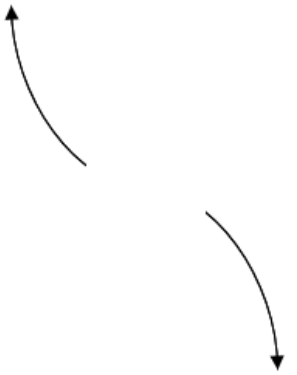
4. Describe the end behavior of the polynomial below.

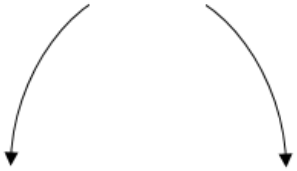
$$f(x) = 2(x+2)^5(x-2)^{10}(x-9)^2(x+9)^2$$

A.

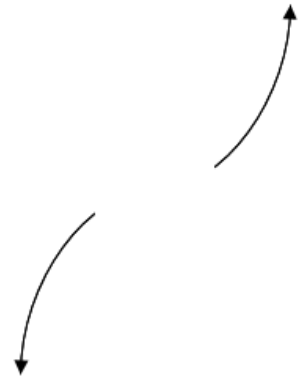


C.

B.



D.



E. None of the above.

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

$$\frac{-7}{3}, -6, \text{ and } \frac{5}{4}$$

A. $a \in [7, 13], b \in [-121, -109], c \in [289, 294],$ and $d \in [-211, -202]$

B. $a \in [7, 13], b \in [85, 94], c \in [34, 46],$ and $d \in [209, 218]$

C. $a \in [7, 13], b \in [-85, -83], c \in [34, 46],$ and $d \in [209, 218]$

D. $a \in [7, 13], b \in [85, 94], c \in [34, 46],$ and $d \in [-211, -202]$

E. $a \in [7, 13], b \in [27, 37], c \in [-225, -220],$ and $d \in [209, 218]$

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6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in

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

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

A. $a \in [3, 13], b \in [-2, 3], c \in [-114, -105],$ and $d \in [172, 177]$

B. $a \in [3, 13], b \in [-61, -58], c \in [176, 187],$ and $d \in [-181, -166]$

C. $a \in [3, 13], b \in [29, 32], c \in [-38, -26],$ and $d \in [-181, -166]$

D. $a \in [3, 13], b \in [53, 69], c \in [176, 187],$ and $d \in [-181, -166]$

E. $a \in [3, 13], b \in [53, 69], c \in [176, 187],$ and $d \in [172, 177]$

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

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

A. $b \in [-16, -10], c \in [56, 67],$ and $d \in [-110, -98]$

B. $b \in [7, 16], c \in [56, 67],$ and $d \in [99, 103]$

C. $b \in [-1, 2], c \in [-14, -7],$ and $d \in [12, 18]$

D. $b \in [-1, 2], c \in [0, 8],$ and $d \in [-10, -6]$

E. None of the above.

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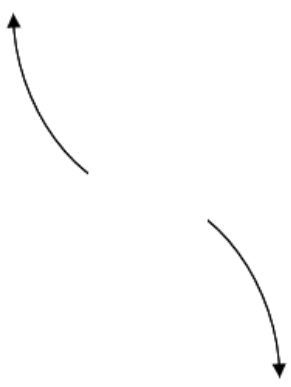
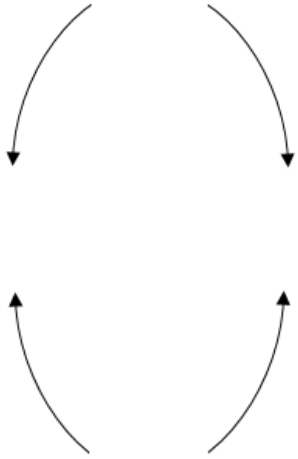
8. Describe the end behavior of the polynomial below.

$$f(x) = 5(x + 4)^5(x - 4)^8(x + 3)^2(x - 3)^3$$

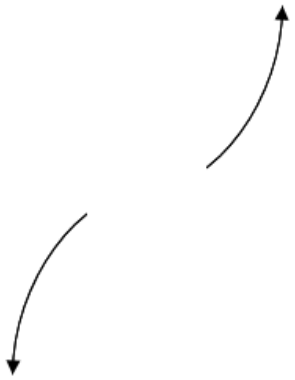


A.

B.



D.



C.

E. None of the above.

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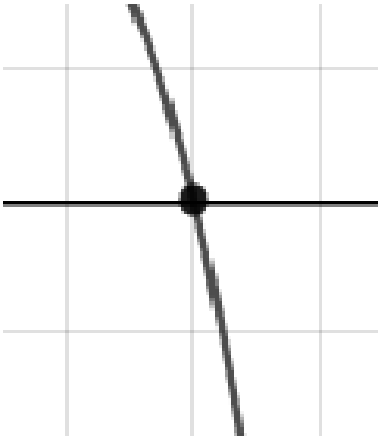
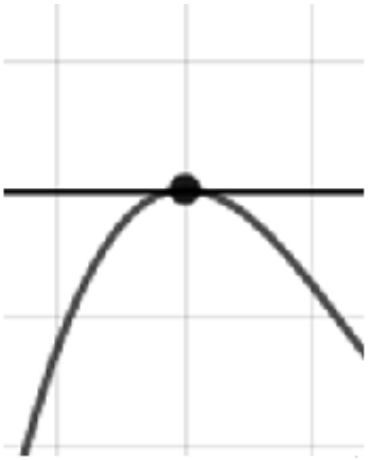
9. Describe the zero behavior of the zero $x = 8$ of the polynomial below.

$$f(x) = -7(x+5)^{12}(x-5)^{8}(x+8)^{12}(x-8)^{9}$$

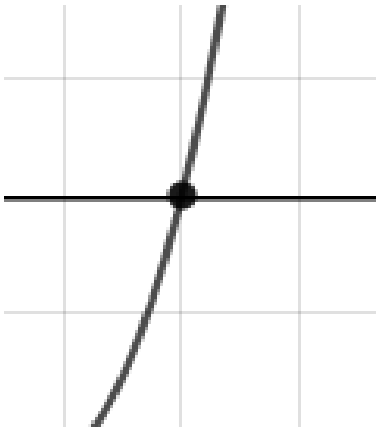
A.



B.



C. 

D. 

E. None of the above.

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

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

A. $b \in [-3, 3.2], c \in [-4, 5],$ and $d \in [-21, -7]$

B. $b \in [1.5, 4.4], c \in [-12, -8],$ and $d \in [-82, -75]$

C. $b \in [-3, 3.2], c \in [1, 8],$ and $d \in [6, 13]$

D. $b \in [-5.7, -2.5], c \in [-12, -8],$ and $d \in [80, 83]$

E. None of the above.
