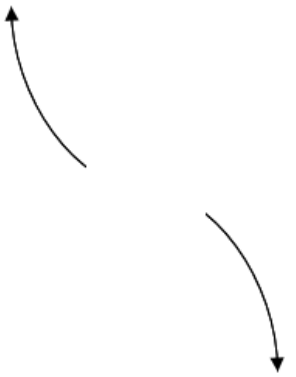
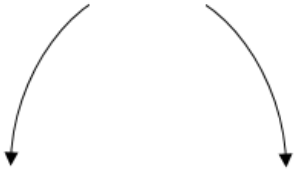
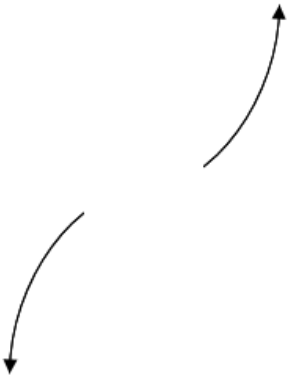
1. Describe the end behavior of the polynomial below.

$$f(x) = -8(x-4)^4(x+4)^5(x+9)^3(x-9)^4$$

A.


B.


C.


D.


E. None of the above.

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

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

A. $b \in [-1.9, 1.65], c \in [0.21, 3.58],$ and $d \in [-17, -10]$

B. $b \in [-1.9, 1.65], c \in [-0.45, 0.03],$ and $d \in [-10, -4]$

C. $b \in [-3.44, -2.63], c \in [6.39, 7.85],$ and $d \in [73, 79]$

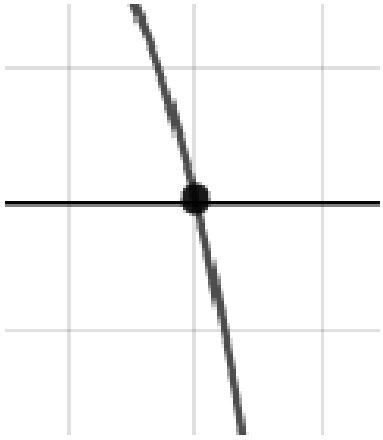
D. $b \in [2.57, 3.6], c \in [6.39, 7.85],$ and $d \in [-75, -74]$

E. None of the above.

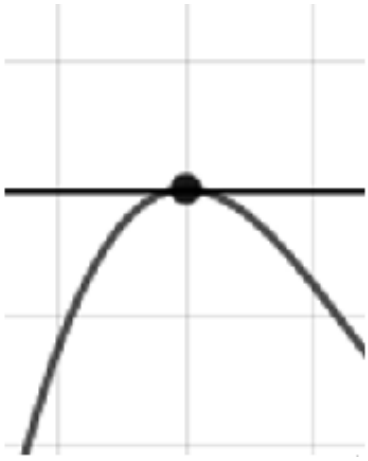
---

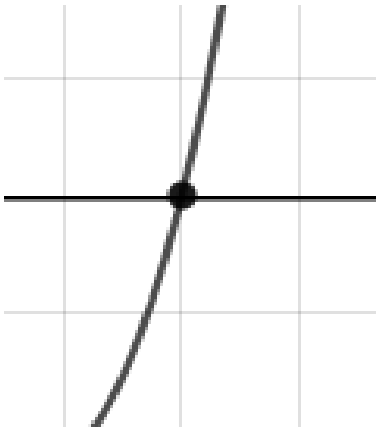
3. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = -9(x+5)^3(x-5)^2(x-8)^6(x+8)^3$$

A. 

C. 

B. 

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

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

A. $a \in [6, 13], b \in [-51, -48], c \in [-22, -13],$ and $d \in [97, 108]$

B. $a \in [6, 13], b \in [43, 51], c \in [-30, -22],$ and $d \in [-111, -103]$

C. $a \in [6, 13], b \in [-80, -75], c \in [161, 167],$ and $d \in [97, 108]$

D. $a \in [6, 13], b \in [-80, -75], c \in [161, 167],$ and $d \in [-111, -103]$

E. $a \in [6, 13], b \in [70, 80], c \in [161, 167],$ and $d \in [97, 108]$

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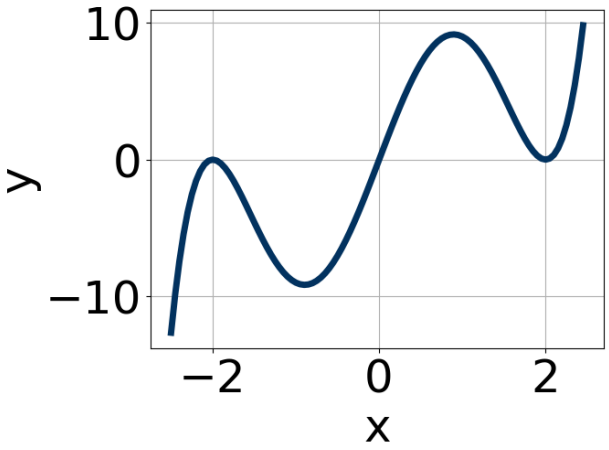
5. Which of the following equations *could* be of the graph presented below?



A. $18x^{10}(x-2)^6(x+2)^9$

B. $17x^7(x-2)^6(x+2)^4$

C. $-9x^8(x-2)^8(x+2)^6$

D. $16x^7(x-2)^8(x+2)^7$

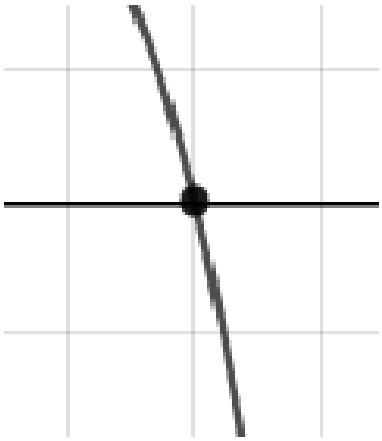
E. $-14x^9(x-2)^8(x+2)^{10}$

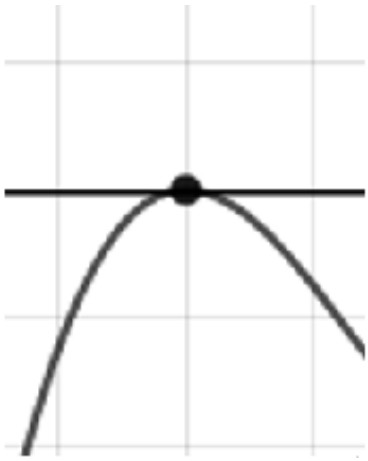
---

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

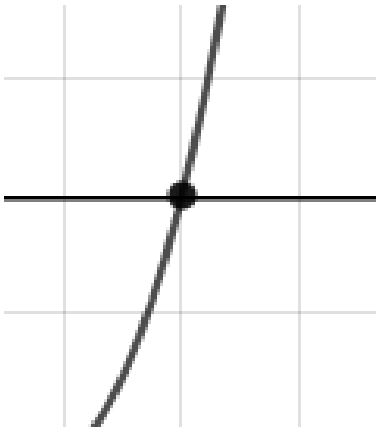
$$f(x) = 7(x-3)^9(x+3)^{10}(x-8)^6(x+8)^7$$

A.



B. 

C. 

D. 

E. None of the above.

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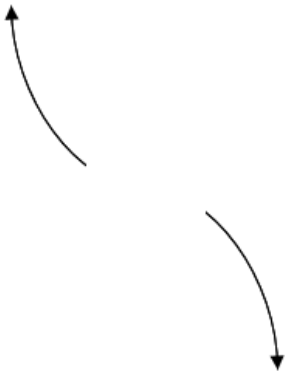
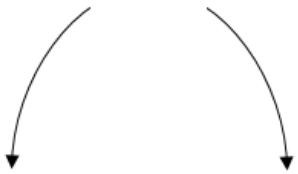
7. Describe the end behavior of the polynomial below.

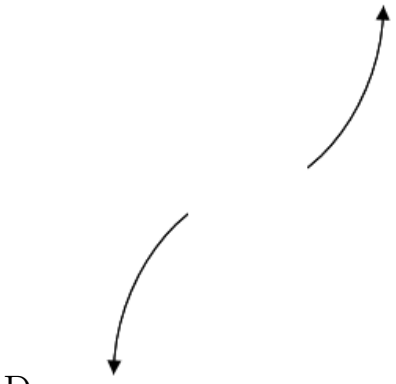
$$f(x) = -9(x+3)^2(x-3)^3(x-8)^3(x+8)^4$$

A. 

B. 

C.

D.



E. None of the above.

---

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

$$-2 - 5i \text{ and } -1$$

A. $b \in [-6.2, -3.4], c \in [31, 34.2],$ and $d \in [-29.2, -25]$

B. $b \in [-3.3, 2.4], c \in [5.7, 6.4],$ and $d \in [2.1, 6.8]$

C. $b \in [1.6, 5.7], c \in [31, 34.2],$ and $d \in [27.5, 30.4]$

D. $b \in [-3.3, 2.4], c \in [-1.2, 4.8],$ and $d \in [0, 3.6]$

E. None of the above.

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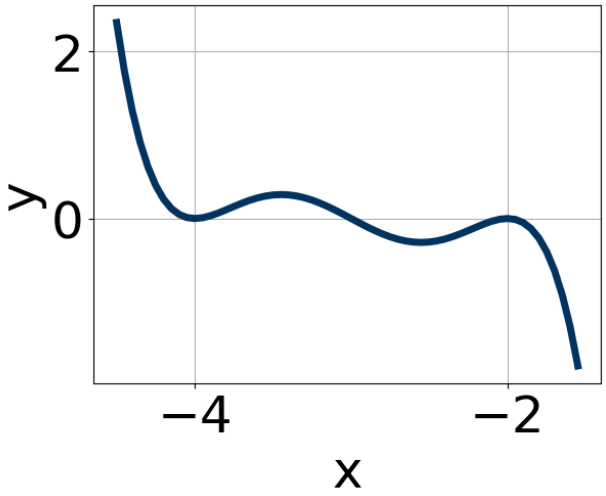
9. Which of the following equations *could* be of the graph presented below?



A. $-7(x+2)^4(x+4)^7(x+3)^{10}$

B. $2(x+2)^6(x+4)^6(x+3)^6$

C. $20(x+2)^6(x+4)^6(x+3)^7$

D. $-9(x+2)^6(x+4)^8(x+3)^{11}$

E. $-15(x+2)^8(x+4)^5(x+3)^5$

---

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

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

A. $a \in [60, 69], b \in [-143, -136], c \in [2, 9],$ and $d \in [100, 106]$

B. $a \in [60, 69], b \in [-69, -57], c \in [-129, -122],$ and $d \in [100, 106]$

C. $a \in [60, 69], b \in [-143, -136], c \in [2, 9],$ and $d \in [-109, -102]$

D. $a \in [60, 69], b \in [24, 32], c \in [-153, -147],$ and $d \in [-109, -102]$

E. $a \in [60, 69], b \in [138, 144], c \in [2, 9],$ and $d \in [-109, -102]$
