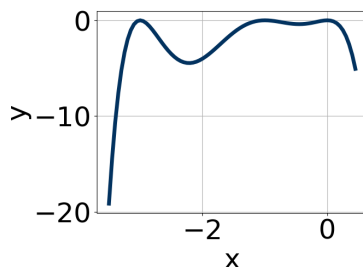


This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found [here](#).

If you have a suggestion to make the keys better, please fill out the short survey [here](#).

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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



The solution is $-19x^6(x+1)^4(x+3)^8$

A. $-15x^8(x+1)^7(x+3)^{11}$

The factors $(x+1)$ and $(x+3)$ should both have even powers.

B. $-19x^6(x+1)^4(x+3)^8$

* This is the correct option.

C. $-8x^6(x+1)^4(x+3)^5$

The factor $(x+3)$ should have an even power.

D. $8x^{10}(x+1)^6(x+3)^7$

The factor $(x+3)$ should have an even power and the leading coefficient should be the opposite sign.

E. $4x^6(x+1)^4(x+3)^8$

This corresponds to the leading coefficient being the opposite value than it should be.

General Comments: Draw the x-axis to determine which zeros are touching (and so have even multiplicity) or cross (and have odd multiplicity).

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

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

The solution is $100x^3 + 215x^2 + 153x + 36$

A. $a \in [91, 101], b \in [-217, -213], c \in [152, 155], \text{ and } d \in [-40, -29]$

$100x^3 - 215x^2 + 153x - 36$, which corresponds to multiplying out $(5x-4)(4x-3)(5x-3)$.

B. $a \in [91, 101], b \in [54, 60], c \in [-67, -59], \text{ and } d \in [-40, -29]$

$100x^3 + 55x^2 - 63x - 36$, which corresponds to multiplying out $(5x+5)(4x-4)(5x-5)$.

C. $a \in [91, 101]$, $b \in [213, 218]$, $c \in [152, 155]$, and $d \in [33, 38]$

* $100x^3 + 215x^2 + 153x + 36$, which is the correct option.

D. $a \in [91, 101]$, $b \in [213, 218]$, $c \in [152, 155]$, and $d \in [-40, -29]$

$100x^3 + 215x^2 + 153x - 36$, which corresponds to multiplying everything correctly except the constant term.

E. $a \in [91, 101]$, $b \in [-103, -91]$, $c \in [-36, -30]$, and $d \in [33, 38]$

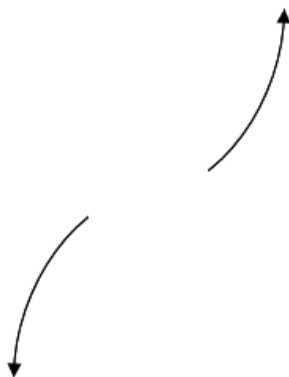
$100x^3 - 95x^2 - 33x + 36$, which corresponds to multiplying out $(5x + 5)(4x + 4)(5x - 5)$.

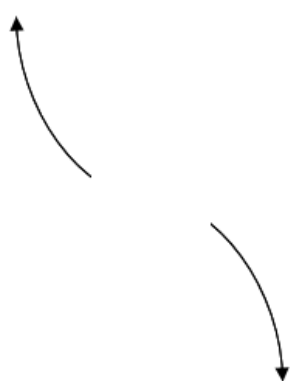
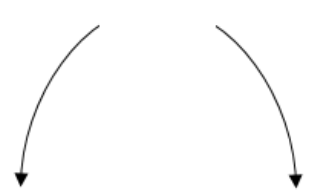
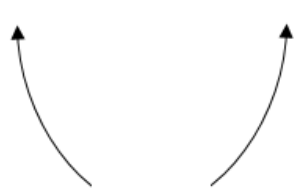
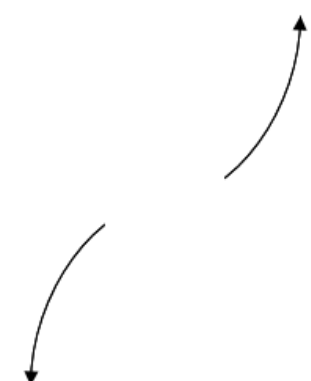
General Comments: To construct the lowest-degree polynomial, you want to multiply out $(5x + 4)(4x + 3)(5x + 3)$

28. Describe the end behavior of the polynomial below.

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

The solution is



 <p>A.</p>	 <p>B.</p>
 <p>C.</p>	 <p>D.</p>
<p>E. None of the figures above.</p>	

A. The function is above the x -axis, then passes through.

B. The function is below the x -axis, then touches.

C. The function is above the x -axis, then touches.

D. The function is below the x -axis, then passes through.

General Comments: Remember that end behavior is determined by the leading coefficient AND whether the **sum** of the multiplicities is positive or negative.

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

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

The solution is $x^3 - 3x - 52$

A. $b \in [-0.55, 0.3]$, $c \in [-3.37, -2.62]$, and $d \in [-55, -49]$

* $x^3 - 3x - 52$, which is the correct option.

B. $b \in [0.39, 1.57]$, $c \in [-1.54, -0.37]$, and $d \in [-21, -11]$

$x^3 + x^2 - x - 12$, which corresponds to multiplying out $(x + 3)(x - 4)$.

C. $b \in [-0.55, 0.3]$, $c \in [-3.37, -2.62]$, and $d \in [50, 54]$

$x^3 - 3x + 52$, which corresponds to multiplying out $(x - (-2 - 3i))(x - (-2 + 3i))(x + 4)$.

D. $b \in [0.39, 1.57]$, $c \in [-2.16, -1.42]$, and $d \in [-11, -4]$

$x^3 + x^2 - 2x - 8$, which corresponds to multiplying out $(x + 2)(x - 4)$.

E. None of the above.

This corresponds to making an unanticipated error or not understanding how to use nonreal complex numbers to create the lowest-degree polynomial. If you chose this and are not sure what you did wrong, please contact the coordinator for help.

General Comments: Remember that the conjugate of $a + bi$ is $a - bi$. Since these zeros always come in pairs, we need to multiply out $(x - (-2 - 3i))(x - (-2 + 3i))(x - (4))$.

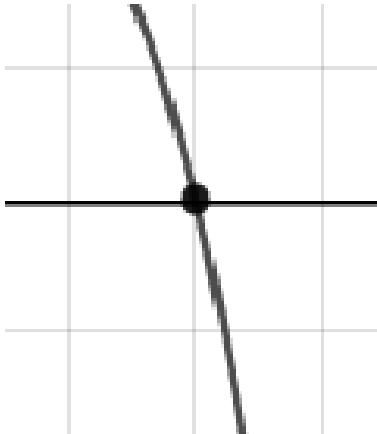


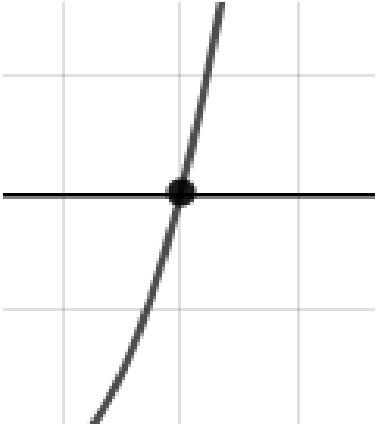
30. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = 4(x + 5)^6(x - 5)^2(x - 8)^7(x + 8)^6$$

The solution is



Answer Key for Module 6 - Polynomial Functions Version B

<p>A.</p> 	<p>B.</p> 
<p>C.</p> 	<p>D.</p> 
<p>E. None of the figures above.</p>	

- A.
- B.
- C.
- D.

General Comments: You will need to sketch the entire graph, then zoom in on the zero the question asks about.
