# Objective 1 - End and Zero Behavior

*Identify the end behavior and zero behavior of a polynomial function.*

Link to section in online textbook.

First, watch this video to learn how to identify the end behavior and zero behavior of polynomial functions. Now practice describing the end behavior and zero behavior of polynomials below.

**Question 1** *Choose the **end behavior** of the polynomial below.*

$$f(x) = -(x+7)^6(x+2)^3(x-2)^2(x-7)$$

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Learning outcomes:
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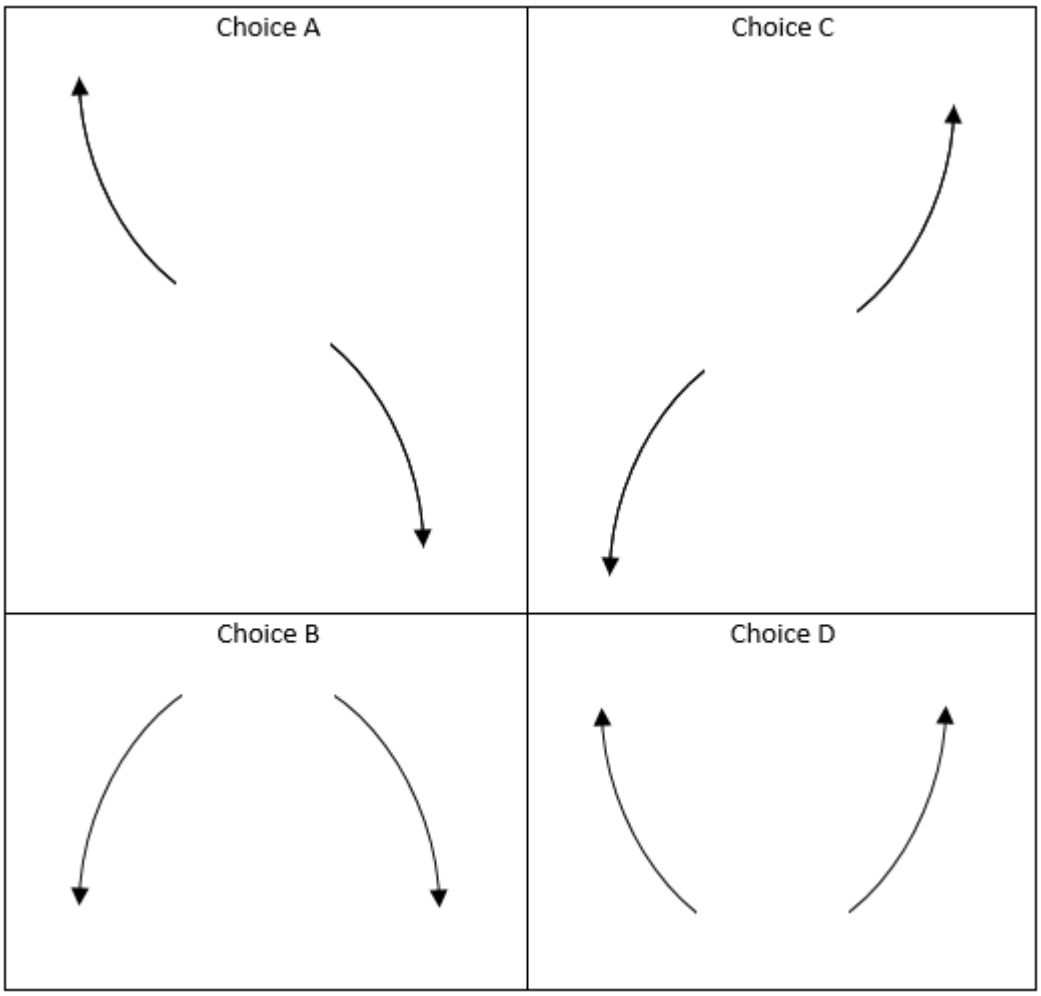



***Multiple Choice:***

(a) *A Choice A*

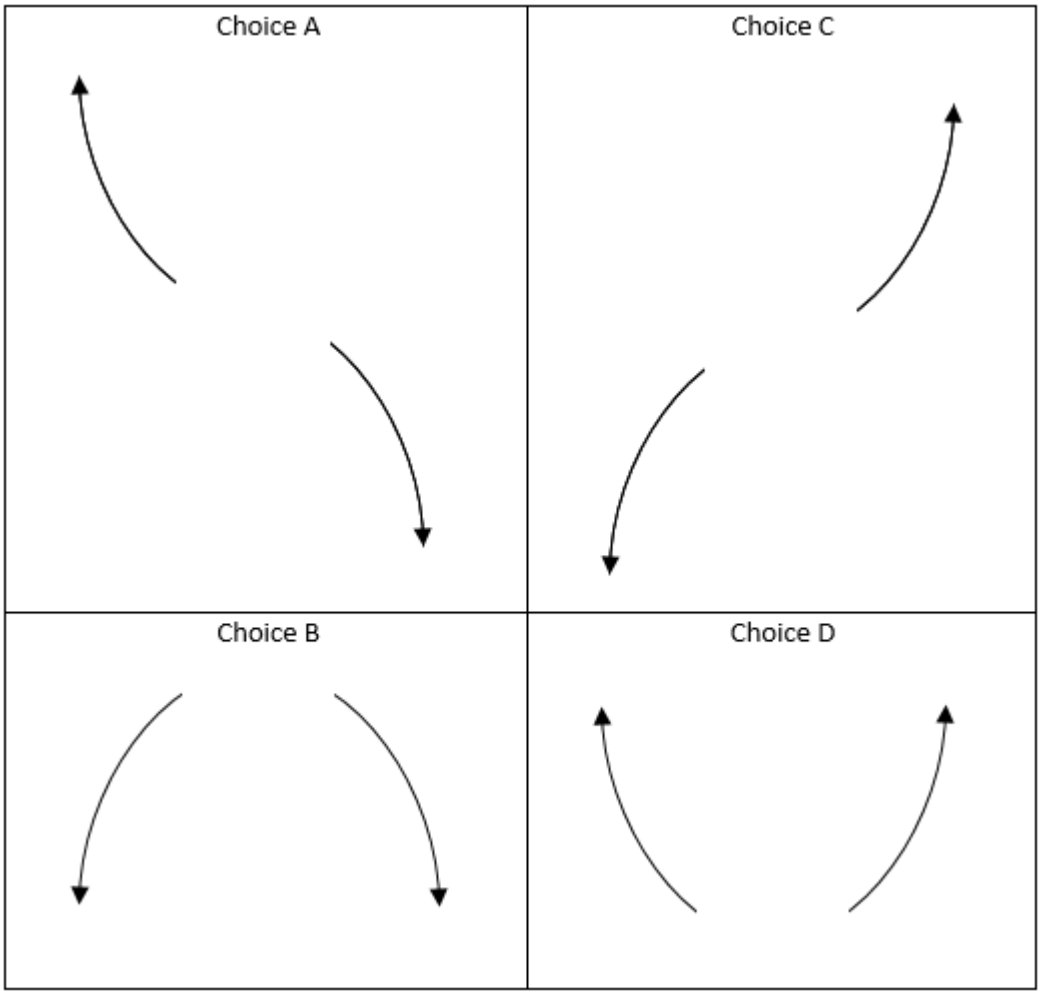
(b) *B* ✓ *Choice B*

(c) *C Choice C*

(d) *D Choice D*

**Question 2** *Choose the* ***end behavior*** *of the polynomial below.*

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




***Multiple Choice:***

(a) *A Choice A*

(b) *B Choice B*

(c) *C* *Choice C*

(d) *D* ✓ *Choice D*

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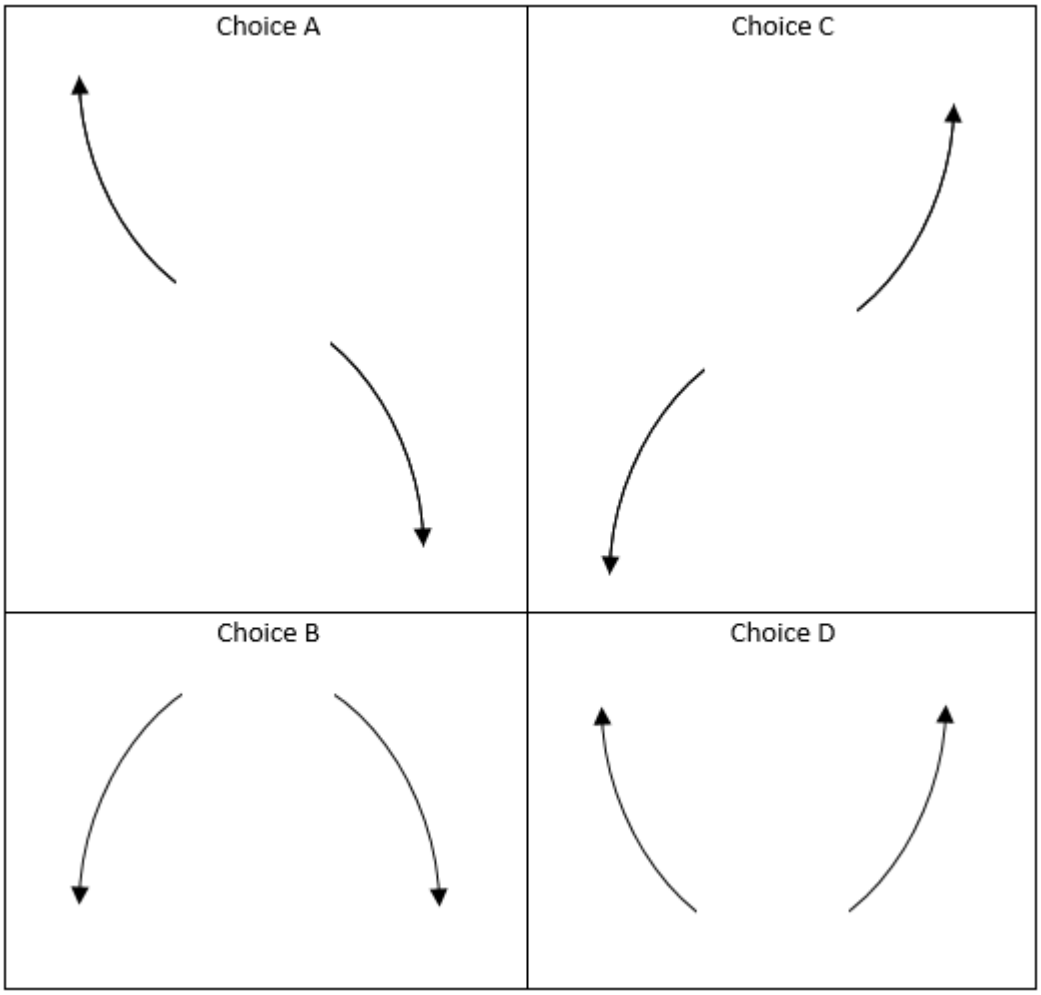
**Question 3** *Choose the* ***end behavior*** *of the polynomial below.*

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




***Multiple Choice:***

(a) *A* ✓ *Choice A*

(b) *B* *Choice B*

(c) *C* *Choice C*

(d) *D* *Choice D*

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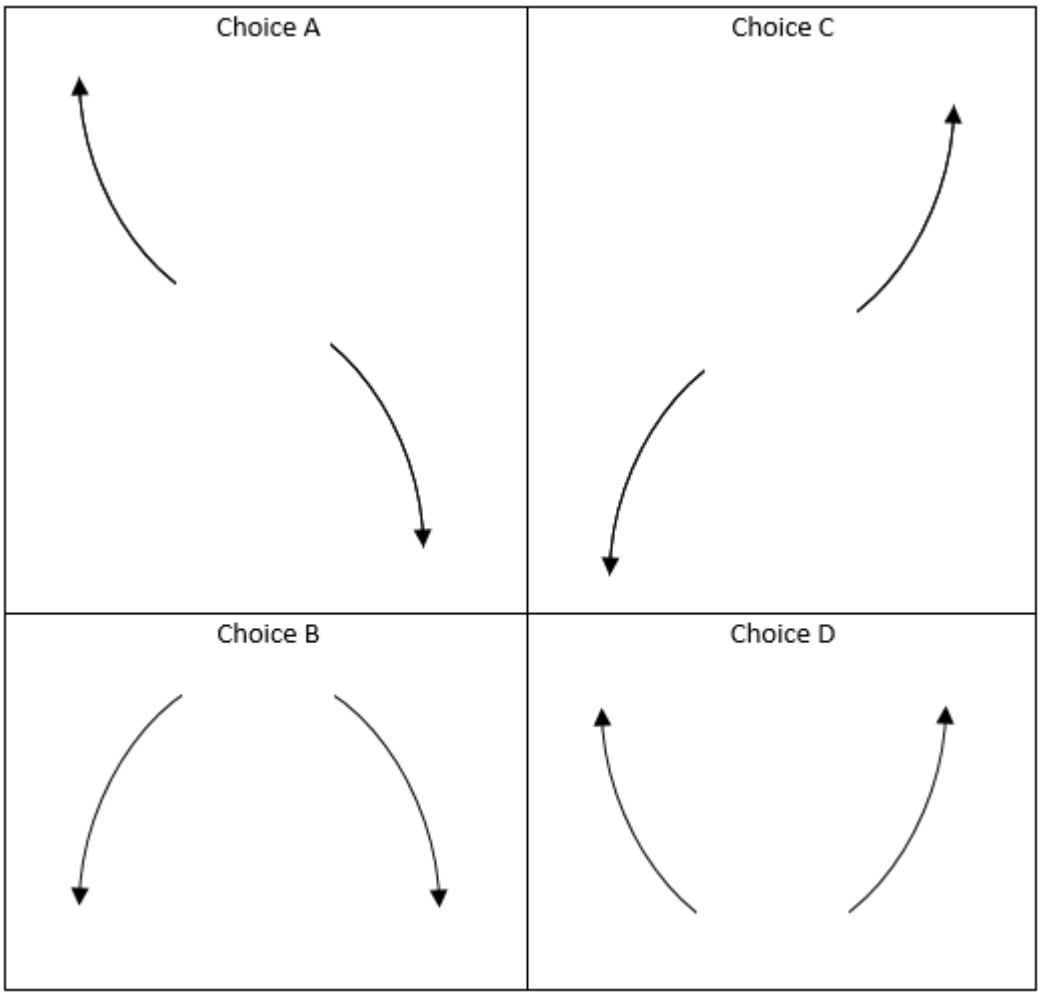
**Question 4** *Choose the* ***end behavior*** *of the polynomial below.*

$$f(x) = (x+7)^2(x+3)(x-3)(x-7)$$




***Multiple Choice:***

(a) *A Choice A*

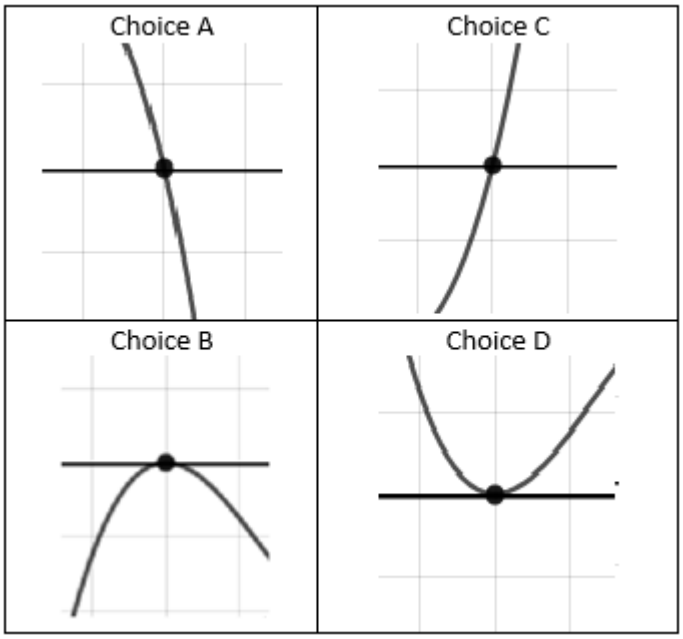
(b) *B Choice B*

(c) *C* ✓ *Choice C*

(d) *D Choice D*

**Question 5** *Choose the option that describes the behavior at $x = -8$ of the polynomial below.*

$$f(x) = -(x+8)^3(x+7)(x-7)(x-8)^2$$




***Multiple Choice:***

(a) *A* ✓ *Choice A*

(b) *B* *Choice B*

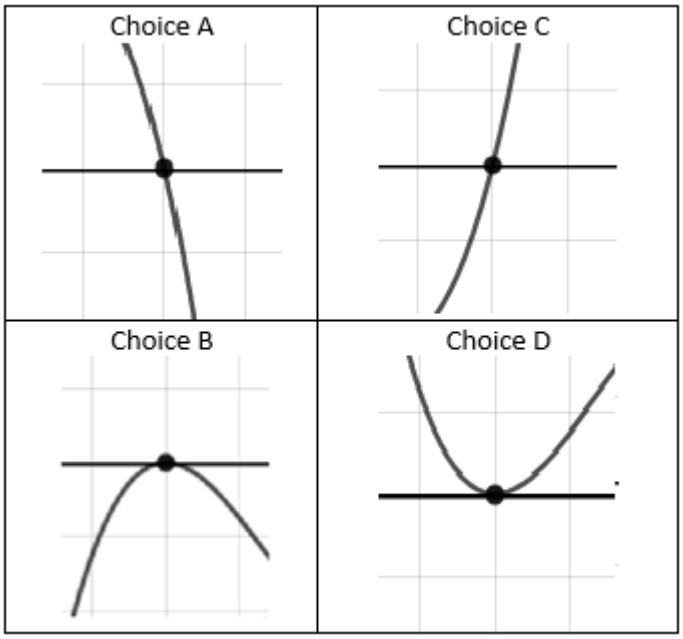
(c) *C* *Choice C*

(d) *D* *Choice D*

***Hint:*** *To know* ***exactly*** *what the zero behavior is, we should sketch the entire function. Clever students may figure out an arithmetic way to check zero behavior, but it is easier to sketch the function using end behavior and multiplicity of the zeros. Here is an example video for this particular type of problem.*

**Question 6** *Choose the option that describes the behavior at $x = -4$ of the polynomial below.*

$$f(x) = -(x+7)^3(x+4)^4(x-4)(x-7)^3$$




***Multiple Choice:***

(a) *A* *Choice A*

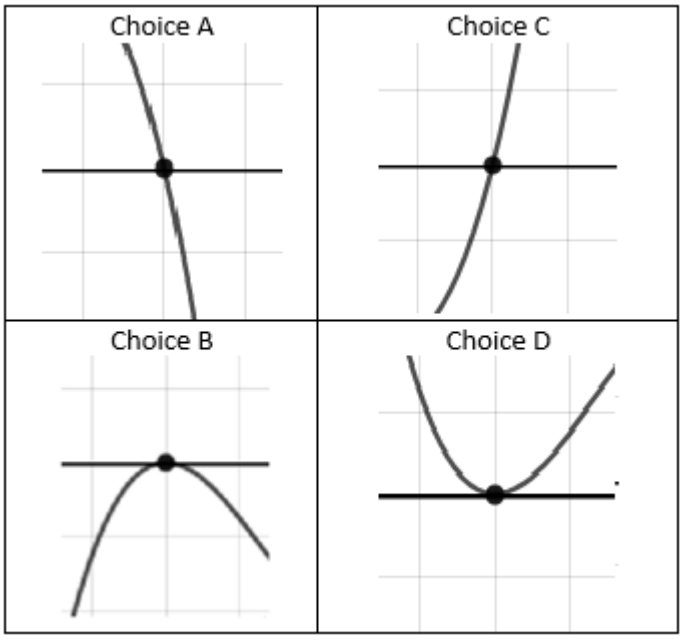
(b) *B* ✓ *Choice B*

(c) *C* *Choice C*

(d) *D* *Choice D*

**Question 7** *Choose the option that describes the behavior at $x = -5$ of the polynomial below.*

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




***Multiple Choice:***

(a) *A* *Choice A*

(b) *B* *Choice B*

(c) *C* *Choice C*

(d) *D* ✓ *Choice D*

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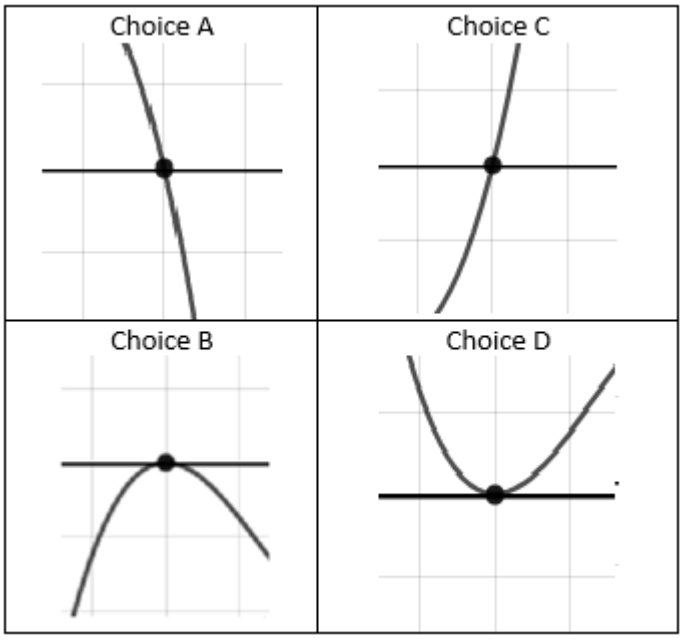
**Question 8** *Choose the option that describes the behavior at $x = -3$ of the polynomial below.*

$$f(x) = (x+3)^3(x+2)^3(x-2)^3(x-3)^2$$




***Multiple Choice:***

(a) *A* *Choice A*

(b) *B* *Choice B*

(c) *C* ✓ *Choice C*

(d) *D* *Choice D*