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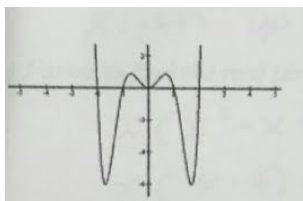
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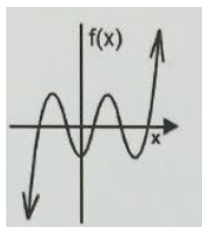
2.2 Polynomial Functions of Higher Degree

Determine whether the graph represents an odd-degree or an even-degree polynomial and determine if the leading coefficient of the function is positive or negative.

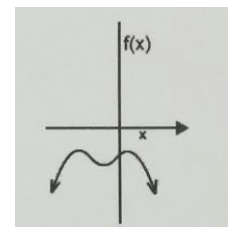
1.



2.



3.



Use the leading coefficient test to determine the right-hand and the left-hand behavior of the graph of the polynomial function.

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

Left:

Right:

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

Left:

Right:

6. $f(x) = x^5 - x$

Left:

Right:

Factor to find the real zeros.

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

8. $f(x) = 6x^4 - 33x^3 - 18x^2$

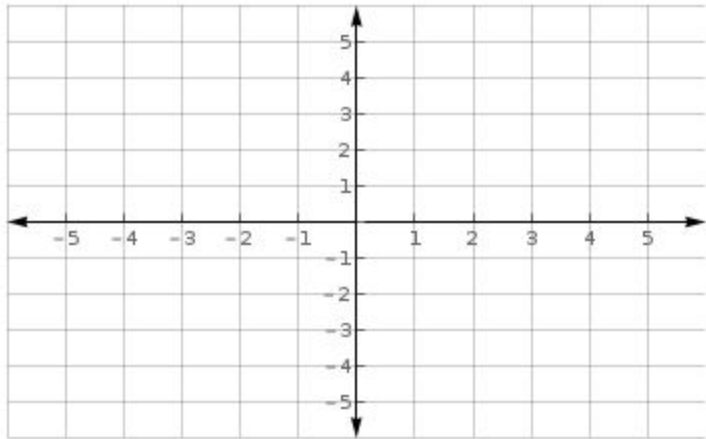
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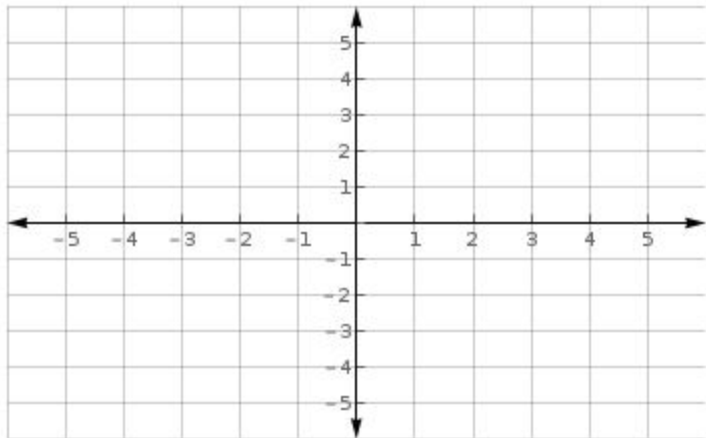
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9. Given the function $f(x) = x^3 - 2x^2 - 3x$

- Apply the leading coefficient test.
- Find the zeros by factoring.
- Find additional points between the zeros.
- Sketch the graph.

10. Given the function $f(x) = x^2(x^2 - 4)$

- Apply the leading coefficient test.
- Find the zeros by factoring.
- Find additional points between the zeros.
- Sketch the graph.



Use the Intermediate Value Theorem and a graphing utility to find intervals of length 1 in which the polynomial function is guaranteed to have a zero.

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

12. $f(x) = 3x^4 + 4x^3 - 3$

Precalculus

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Find a polynomial function that has the given zeros.

13. $x(x-2)(x-3)$

14. $(3x-1)(x-1)(x-2)$

15. $x = 3, 2 + \sqrt{11}, 2 - \sqrt{11}$