

Describe the end behavior of the graph of the polynomial function WITHOUT graphing.

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| <p>A $f(x) = 4x - 2 + 5x^5$ Odd + \uparrow as $x \rightarrow -\infty, y \rightarrow -\infty$ and as $x \rightarrow +\infty, y \rightarrow +\infty$</p> | <p>B $f(x) = -5x^3$ Odd - \downarrow as $x \rightarrow -\infty, y \rightarrow +\infty$ and as $x \rightarrow +\infty, y \rightarrow -\infty$</p> | <p>C $f(x) = -12x^6 - 2x + 5$ Even - as $x \rightarrow -\infty, y \rightarrow -\infty$ and as $x \rightarrow +\infty, y \rightarrow -\infty$</p> |
| <p>D $f(x) = 6 - 2x + 4x^2 - 5x^3$ -odd \downarrow as $x \rightarrow -\infty, y \rightarrow +\infty$ and as $x \rightarrow +\infty, y \rightarrow -\infty$</p> | <p>E $f(x) = 1 - x^6 - 1 + 2x^6$ Even + as $x \rightarrow -\infty, y \rightarrow +\infty$ and as $x \rightarrow +\infty, y \rightarrow +\infty$</p> | <p>F $f(x) = 2x^5 - 7x^2 - 4x$ + odd \uparrow as $x \rightarrow -\infty, y \rightarrow -\infty$ and as $x \rightarrow +\infty, y \rightarrow +\infty$</p> |

11. Sketch a graph of each polynomial. Determine the zeros. Describe the end behavior.

A. $p(x) = (x+5)^2$
 $(x+5)(x+5)$
 $x^2 + 10x + 25$
 Even + \uparrow

zeros: $-5, -5$ ($-5, 0$) multiplicity 2
 as $x \rightarrow -\infty, y \rightarrow +\infty$
 and as $x \rightarrow +\infty, y \rightarrow +\infty$

B. $p(x) = -(x-2)^2$
 $-(x-2)(x-2)$
 $-x^2 + 4x - 4$
 Even - \downarrow

zeros: $x=2, 2$ ($2, 0$) multiplicity 2
 as $x \rightarrow -\infty, y \rightarrow -\infty$
 and as $x \rightarrow +\infty, y \rightarrow -\infty$

C. $p(x) = x(x-2)(x+1)$

Odd + \uparrow

zeros: $0, 2, -1$ ($0, 0$) multiplicity 2

D. $p(x) = -(x-3)(x+6)^2$

-odd \downarrow

zeros: $3, -6, -6$ ($3, 0$) multiplicity 2

E. $p(x) = (x-1)^2(x+4)^2(x-2)$

Even + \uparrow

zeros: $1, 1, -4, -4, 2$ ($1, 0$) multiplicity 2, ($-4, 0$) multiplicity 2