Graphing Polynomial Functions: Basic Shape

Describe the end behavior of each function.

1) $f(x) = x^3 - 4x^2 + 7$

+ odd ↓↑

$x \to -\infty \quad y \to -\infty$

$x \to \infty \quad y \to \infty$

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

+ odd ↓↑

$x \to -\infty, \ y \to -\infty$

$x \to \infty, \ y \to \infty$

3) $f(x) = x^3 - 9x^2 + 24x - 15$

+ odd ↓↑

$x \to -\infty, \ y \to \infty$

$x \to \infty, \ y \to \infty$

4) $f(x) = x^2 - 6x + 11$

Even + ↑↑

$x \to -\infty, \ y \to \infty$

$x \to \infty, \ y \to \infty$

5) $f(x) = x^5 - 4x^3 + 5x + 2$

+ odd ↓↑

$x \to -\infty, \ y \to -\infty$

$x \to \infty, \ y \to \infty$

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

Even − ↓↓

$x \to -\infty, \ y \to -\infty$

$x \to \infty, \ y \to -\infty$

7) $f(x) = 2x^2 + 12x + 12$

Even + ↑↑

$x \to -\infty, \ y \to \infty$

$x \to \infty, \ y \to \infty$

8) $f(x) = x^2 - 8x + 18$

Even + ↑↑

$x \to -\infty, \ y \to \infty$

$x \to \infty, \ y \to \infty$

State the maximum number of turns the graph of each function could make.

9) $f(x) = x^5 - 4x^3 + 5x + 1$

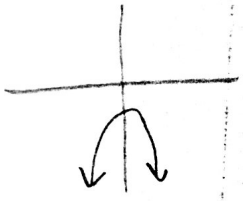
4

10) $f(x) = -x^2 - 1$

1

Sketch the general shape of each function.

11) $f(x) = -x^2 - 6x - 7$ − Even ↓↓

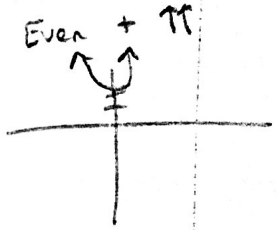


12) $f(x) = x^3 - 2x^2 + 1$

odd + ↓↑

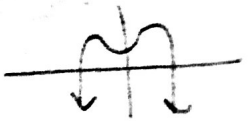
13) $f(x) = x^2 + 2$

Even + ↑↑



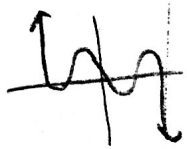
14) $f(x) = -x^4 + 3x^3 - 2 - 5x$

- Even ↓↓



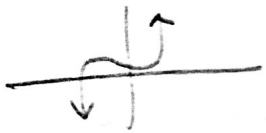
15) $f(x) = -x^5 + 4x^3 - x + 1$

- odd ↑↓



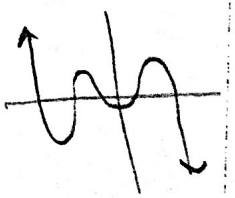
16) $f(x) = x^3 - 2x^2 - 3$

odd + ↓↑



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

- odd



18) $f(x) = -x^3 + 10x^2 - 33x + 32$

- odd ↑↓