

Name : _____

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End Behavior of Polynomial Functions

Identify the end behavior of the given polynomial functions.

① $f(x) = x^3 - 2x^2 + 3$

② $f(x) = 3x^6 - 7x^4 - 2x^9$

③ $f(x) = -x^3 + 3x^2 - 4$

④ $f(x) = x^4 - 4x^2 + 2x + 4$

⑤ $f(x) = x^5 + 3x^3 + 3$

⑥ $f(x) = -x^5 + 3x^3 + 3$

⑦ $f(x) = -x^2 - 8x - 15$

⑧ $f(x) = x^3 - 3x^2 + 1$

⑨ $f(x) = -2x^2 + 16x - 29$

⑩ $f(x) = -x^4 + x^3 - x^2$

⑪ $f(x) = x^4 - 6x^3 + 8x^2$

⑫ $f(x) = -x^4 + 4x^3 - 4x^2$

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End Behavior of Polynomial Functions

Answers

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

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

2 $f(x) = 3x^6 - 7x^4 - 2x^9$

$$f(x) \rightarrow \infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

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

$$f(x) \rightarrow \infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

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

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

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

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

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

$$f(x) \rightarrow \infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

7 $f(x) = -x^2 - 8x - 15$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

8 $f(x) = x^3 - 3x^2 + 1$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

9 $f(x) = -2x^2 + 16x - 29$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

10 $f(x) = -x^4 + x^3 - x^2$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$

11 $f(x) = x^4 - 6x^3 + 8x^2$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow \infty \text{ as } x \rightarrow \infty$$

12 $f(x) = -x^4 + 4x^3 - 4x^2$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty,$$
$$f(x) \rightarrow -\infty \text{ as } x \rightarrow \infty$$