

1.6 Polynomial Functions and End Behavior

1.6 Practice

AP Precalculus

Describe the end behavior of each function using limit notation.

1. $g(x) = 4x^7 - 3x^4 + x$

$$\lim_{x \rightarrow -\infty} p(x) = -\infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = \infty$$

2. $p(x) = 7x^4 + 3x^3 - 3x - 4$

$$\lim_{x \rightarrow -\infty} p(x) = \infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = \infty$$

3. $f(x) = -7x^9 - 8x^3 + 6$

$$\lim_{x \rightarrow -\infty} p(x) = \infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = -\infty$$

4. $g(x) = -3x^6 + 5x^3 - 2x + 6$

$$\lim_{x \rightarrow -\infty} p(x) = -\infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = -\infty$$

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

$$\lim_{x \rightarrow -\infty} p(x) = -\infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = \infty$$

6. $p(x) = -8x^2 - 3x + 10$

$$\lim_{x \rightarrow -\infty} p(x) = -\infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = -\infty$$

7. $p(x) = -6x^5 + x^4 + 5x^2 - 4$

$$\lim_{x \rightarrow -\infty} p(x) = \infty$$

and

$$\lim_{x \rightarrow \infty} p(x) = -\infty$$

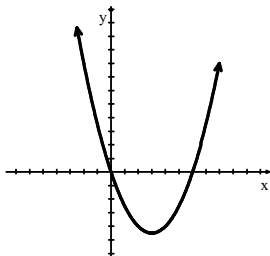
8. $f(x) = 3x^2 + 8x + 11$

$$\lim_{x \rightarrow -\infty} p(x) = \infty$$

and

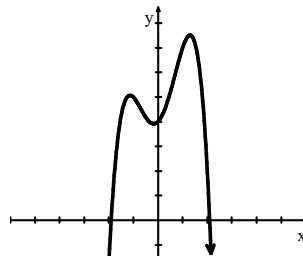
$$\lim_{x \rightarrow \infty} p(x) = \infty$$

9.



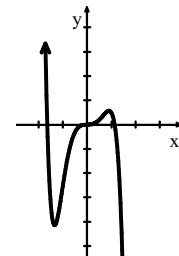
$$\lim_{x \rightarrow -\infty} p(x) = \infty \text{ and } \lim_{x \rightarrow \infty} p(x) = \infty$$

10.



$$\lim_{x \rightarrow -\infty} p(x) = -\infty \text{ and } \lim_{x \rightarrow \infty} p(x) = -\infty$$

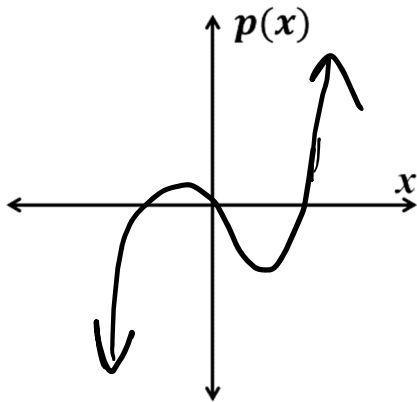
11.



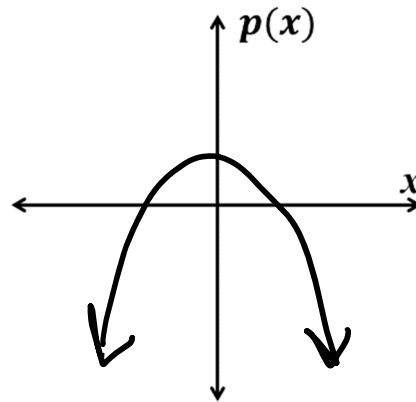
$$\lim_{x \rightarrow -\infty} p(x) = \infty \text{ and } \lim_{x \rightarrow \infty} p(x) = -\infty$$

Sketch the graph of a polynomial function that could match each statement.

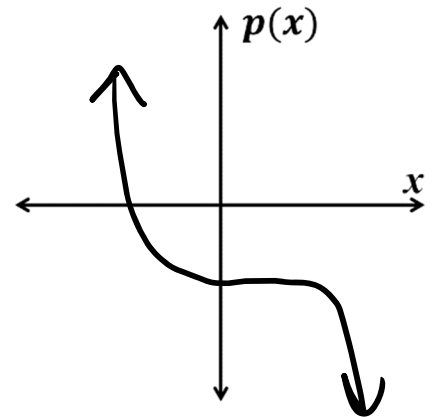
12. $\lim_{x \rightarrow -\infty} p(x) = -\infty$ and
 $\lim_{x \rightarrow \infty} p(x) = \infty$



13. $\lim_{x \rightarrow -\infty} p(x) = -\infty$ and
 $\lim_{x \rightarrow \infty} p(x) = -\infty$



14. $\lim_{x \rightarrow -\infty} p(x) = \infty$ and
 $\lim_{x \rightarrow \infty} p(x) = -\infty$



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1.6 Test Prep

15. The following polynomial function f is given by $f(x) = -7x^6 + 2x^2 + 4$. Which of the following statements about the end behavior of f is true?

- (A) The sign of the leading term of f is positive, and the degree of the leading term of f is even; therefore,
 $\lim_{x \rightarrow -\infty} f(x) = \infty$ and $\lim_{x \rightarrow \infty} f(x) = \infty$.
- (B) The sign of the leading term of f is negative, and the degree of the leading term of f is odd; therefore,
 $\lim_{x \rightarrow -\infty} f(x) = \infty$ and $\lim_{x \rightarrow \infty} f(x) = -\infty$.
- (C) The sign of the leading term of f is positive, and the degree of the leading term of f is odd; therefore,
 $\lim_{x \rightarrow -\infty} f(x) = -\infty$ and $\lim_{x \rightarrow \infty} f(x) = \infty$.
- (D)** The sign of the leading term of f is negative, and the degree of the leading term of f is even; therefore,
 $\lim_{x \rightarrow -\infty} f(x) = -\infty$ and $\lim_{x \rightarrow \infty} f(x) = -\infty$.

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