Name : _____

MATH MONKS

Polynomial End Behavior Worksheet

For each polynomial function describe the end behavior using symbols.

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

6. $f(x) = 2x^5 + 8x^2 + 7x$

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

7. $f(x) = -11x^4 - 7x^2$

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

8. $f(x) = 6x^3 + 1$

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

   As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

   As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

10. $f(x) = -2x^2 + 16x - 24$

    As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

    As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

    As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

    As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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

    As $x \longrightarrow \infty$, $f(x) \longrightarrow$ _____

    As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ _____

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Answers

① $f(x) = -x^2 + 4x - 3$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

② $f(x) = -x^2 + 5$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

③ $f(x) = x^3 - 3x^2 + 1$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

④ $f(x) = 2x^2 - 3$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ ∞

⑤ $f(x) = x^3 - 3x^2 + 4$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑥ $f(x) = 2x^5 + 8x^2 + 7x$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑦ $f(x) = -11x^4 - 7x^2$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑧ $f(x) = 6x^3 + 1$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑨ $f(x) = x^2(x - 3)^3$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ ∞

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑩ $f(x) = -2x^2 + 16x - 24$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ $-\infty$

⑪ $f(x) = -x^5 + 4x^3 - 4x + 2$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ ∞

⑫ $f(x) = -x^3 + 3x^2 - 4$

As $x \longrightarrow \infty$, $f(x) \longrightarrow$ $-\infty$

As $x \longrightarrow -\infty$, $f(x) \longrightarrow$ ∞