



Polynomial Tic-Tac-Toe

► **Materials:**

- Paper
- Pencil
- Tic-Tac-Toe play boards
- Expressions

► **Directions:**

Work with a partner. One student can be O's and answer odd numbered questions. The other student can be X's and can answer the even numbered questions. Find your answer on one of the tic-tac-toe play boards. Students place either their X or O on the correct answer. Try to get 3 in a row. For each correct answer, the corresponding student is given a point. If a student makes 3 X's or O's in a row, they are given 5 points. If there is a stalemate, each student is given 2 points.

► **Who Wins?**

The student with the most amount of points after all questions are answered and tic-tac-toe boards are filled wins.

Tic-Tac-Toe Board:

$2x^2 - 5$	$6x^6$	$7x^4 + 3x^3 + x^2 + 8$
-14	$5x^6 + 3x^2 + 4$	$6x^2 + 5x$
$14x^7$	$625x^8$	$5x^2 + 9$

$x^2 + 2x - 15$	$12x^2 - 7x$	$15x^6 + 12x^2 + 27$
$6x^2 + 4x - 10$	$3x^5 + 2x^2 + 2$	$-24x^5 - 13x^2 - 16$
-34	$16x^6$	$5x^6 + 3x^5 + 3x^2 + 3$

Expressions:

In Exercises 1–4, write the polynomial in standard form.

1. $4 + 5x^6 + 3x^2$ 2. $2 + 3x^5 + 2x^2$ 3. $5x^6 + 3x^2 + 3 + 3x^5$ 4. $x^2 + 3x^3 + 8 + 7x^4$

In Exercises 5 and 6, simplify the polynomial and write it in standard form.

5. $-8(2 + 3x^5 + 2x^2) + 3x^2$ 6. $3x^2 + 3(9 + 5x^6 + 3x^2)$

In Exercises 7–10, find the sum or difference.

7. $(8x^2 + 7) - (3x^2 - 2)$ 8. $(5x^2 - 3) - (3x^2 + 2)$
9. $(x^2 + 3x) + (5x^2 + 2x)$ 10. $(8x^2 - 9x) + (4x^2 + 2x)$

In Exercises 11–14, simplify the expression.

11. $(3x^2)(2x^4)$ 12. $(5x^2)^4$ 13. $(4x^3)^2$ 14. $(7x^3)(2x^4)$

In Exercises 15 and 16, find the product and simplify.

15. $(x - 3)(x + 5)$ 16. $(3x + 5)(2x - 2)$

In Exercises 17 and 18, find the value of the function for $x = -3$.

17. $f(x) = -2x^2 + 4$ 18. $f(x) = -4x^2 + 2$