

Name:

Date:

Period:

## Polynomials Practice Test

1. Graph the polynomial function  $y = -\frac{1}{2}(x-5)^3 + 2$ . Identify the parent function, the number of turning points, least degree, local minimum, local maximum, end behavior, domain, range, increasing and decreasing intervals.
2. Graph the polynomial function  $y = 3(x-2)^4 - 1$ . Identify the parent function, the number of turning points, least degree, local minimum, local maximum, end behavior, domain, range, increasing and decreasing intervals.
3. Graph the polynomial function  $y = \frac{2}{3}(x+1)^4 + 3$ . Identify the parent function, the number of turning points, least degree, local minimum, local maximum, end behavior, domain, range, increasing and decreasing intervals.
4. Graph the polynomial function  $y = (x-2)(x+1)^2(x-1)(x-4)$ . Identify the turning points, least degree, local minimum, local maximum, end behavior, domain, range increasing and decreasing intervals, x-and y-intercepts.
5. Graph the polynomial function  $y = -\frac{1}{3}(x+4)^3(x+2)(x-3)$ . Identify the turning points, least degree, local minimum, local maximum, end behavior, domain, range increasing and decreasing intervals, x-and y-intercepts.
6. Factor the polynomial  $16x^2 - 4y^2$ .
7. Factor the polynomial  $8y^3 + 1$ .

8. Factor the polynomial  $4c^3 + 8c^2d - 4cd^2 - 8d^3$ .

9. Solve the equation  $2x^2 = 72$ .

10. Solve the equation  $4y^3 + 48y^2 = 4y^4$ .

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11. Solve the equation  $(2x^2 + 3) = 4x(x^3 + 6)$ .

12. Divide  $(x^3 - 2x^2 - 9) \div (x - 3)$ . Use synthetic division if possible.

13. Divide  $(x^4 - 10x^2 + 2x + 3) \div (x - 3)$ . Use synthetic division if possible.

14. List all the possible rational zeros of  $f(x) = 2x^3 + x^2 + 2x + 1$ , using the rational zero theorem. Then find all the zeros of the function.

15. List all the possible rational zeros of  $f(x) = x^3 + 2x^2 - 11x - 12$ , using the rational zero theorem. Then find all the zeros of the function.

16. Write a polynomial function of least degree that has real coefficients, the given zeros,  $4, -3, 2 - i$  and a leading coefficient of 1.

17. Write a polynomial function of least degree that has real coefficients, the given zeros, 3, -3, -7 and a leading coefficient of 1.

18. Solve the inequality  $x^3 - x^2 - 16x + 16 \geq 0$ , using any method

19. Solve the inequality  $3x^3 - 6x^2 - 2x \leq 7x$ , using any method.

20. Solve the inequality  $-6x^3 + 19x^2 \geq -10x$ , using any method.