

1. Simplify  $(3x^2y^5)(-7x^{-8}y^4)$

Ans:  $-\frac{21y^9}{x^6}$

2. State the degree of the equation  $3x^5 + 2x^2 + 4$ .

Ans: 5

3. Identify if  $\sqrt{3x^4} - 2x + 4$  is a polynomial.

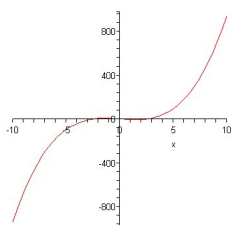
Ans: Yes

4. Use synthetic substitution to find  $f(-1)$  in the equation  $f(x) = 4x^3 - 2x^2 + 7x - 1$

Ans: -6

5. Graph  $f(x) = x^3$  based on its degree and leading coefficient.

Ans:



6. Factor  $3x^4 - 9x^3 + 12x^2 = 0$ .

Ans:  $3x^2(x^2 - 3x + 4)$

7. Factor  $-2x^3 - 4x^2 - 3x - 6 = 0$  by grouping.

Ans:  $(-2x^2 - 3)(x + 2)$

8. Factor  $x^3 + 216 = 0$ .

Ans:  $(x + 6)(x^2 - 6x + 36)$

9. Factor  $x^4 - 7x^2 - 8 = 0$ .

Ans:  $(x^2 - 8)(x^2 + 1)$

10. Solve for x:  $-\frac{3}{4}(x + 2)^2(x - 4)^3(x + 1) = 0$ .

Ans:  $x = 2, x = 4, x = -1$

11. Use long division to divide  $x^4 + 2x^2 - x + 5$  by  $x - 1$ .

Ans:  $x^3 + 2x^2 - x + 5 + \frac{7}{x-1}$

12. Use synthetic division to divide  $f(x) = x^3 - 3x^2 - 7x + 6$  given that  $x + 2 = 0$ .

Ans:  $x^2 - 5x + 3$

13. Use the Rational Zero Theorem to find all the zeros of  $f(x) = x^6 - 2x^4 - 11x^2 + 12$ .

Ans:  $x = \pm 1, x = \pm 2, x = \pm$

14. Write a polynomial function of the least possible degree with real coefficients, the given zeros and a leading coefficient of 1:  $5, -2, 3 + i$

Ans:  $x^4 - 9x^3 + 18x^2 + 30x - 100$

15. Write a cubic function whose graph passes through the given points:  $(3, 0), (2, 0), (-4, 0), (5, 7)$ .

Ans:  $f(x) = -\frac{7}{54}(x - 3)(x - 2)(x + 4)$

16. Transform  $f(x) = x^3 + 2x^2 - 4x - 8$  for  $f(x + 2)$ .

Ans:

17. Simplify  $\left[\frac{x}{y}\right]^{-5}$ .

Ans:  $\frac{y^5}{x^5}$

18. Simplify  $7xy^0 - 5x^0 + (2z)^0$ .

Ans:  $7x - 5$

19. Identify if  $\frac{3x^2-5}{7}$  is a polynomial.

Ans: Yes

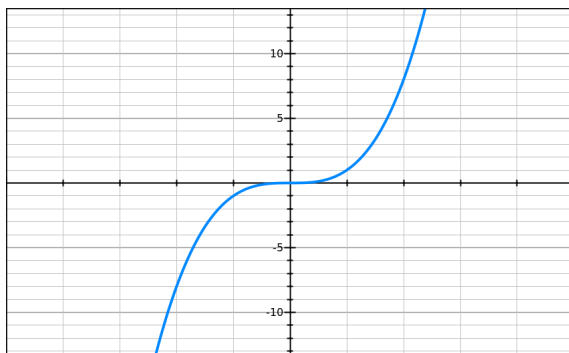
20. Factor  $64x^3 + 125y^3 = 0$ .

Ans:  $(4x + 5y)(16x^2 - 10xy + 25y^2)$

21. Factor  $2x^5 - 8x = 0$ .

Ans:  $2x(x^2 + 2)(x^2 - 2)$

22. Graph  $f(x) = 2x^4 - 26x^2 + 72$ .



23. Simplify  $\frac{x}{y}]^{-5}$ .

Ans:  $\frac{y^5}{x^5}$

24. Find all zeros of  $f(x) = 2x^3 - 9x^2 - 32x - 21$  using synthetic substitution, given that  $x - 7 = 0$ .

Ans:  $x = 7, x = -1, -\frac{3}{2}$

25. Use the Rational Zero Theorem to find all the zeros of  $f(x) = 3x^3 + 13x^2 + 2x - 8$ .

Ans:  $x = -4, x = -1, \frac{2}{3}$

26. Write a polynomial function of the least possible degree with real coefficients, the given zeroes and a leading coefficient of  $-3$ :  $1, 5 - i, 2i$ .

Ans:  $f(x) = -3(x - 1)(x^2 - 10x + 26)(x^2 + 4)$

27. Transform  $f(x) = x^3 + 2x^2 - 4x - 8$  for  $-f(x)$ .