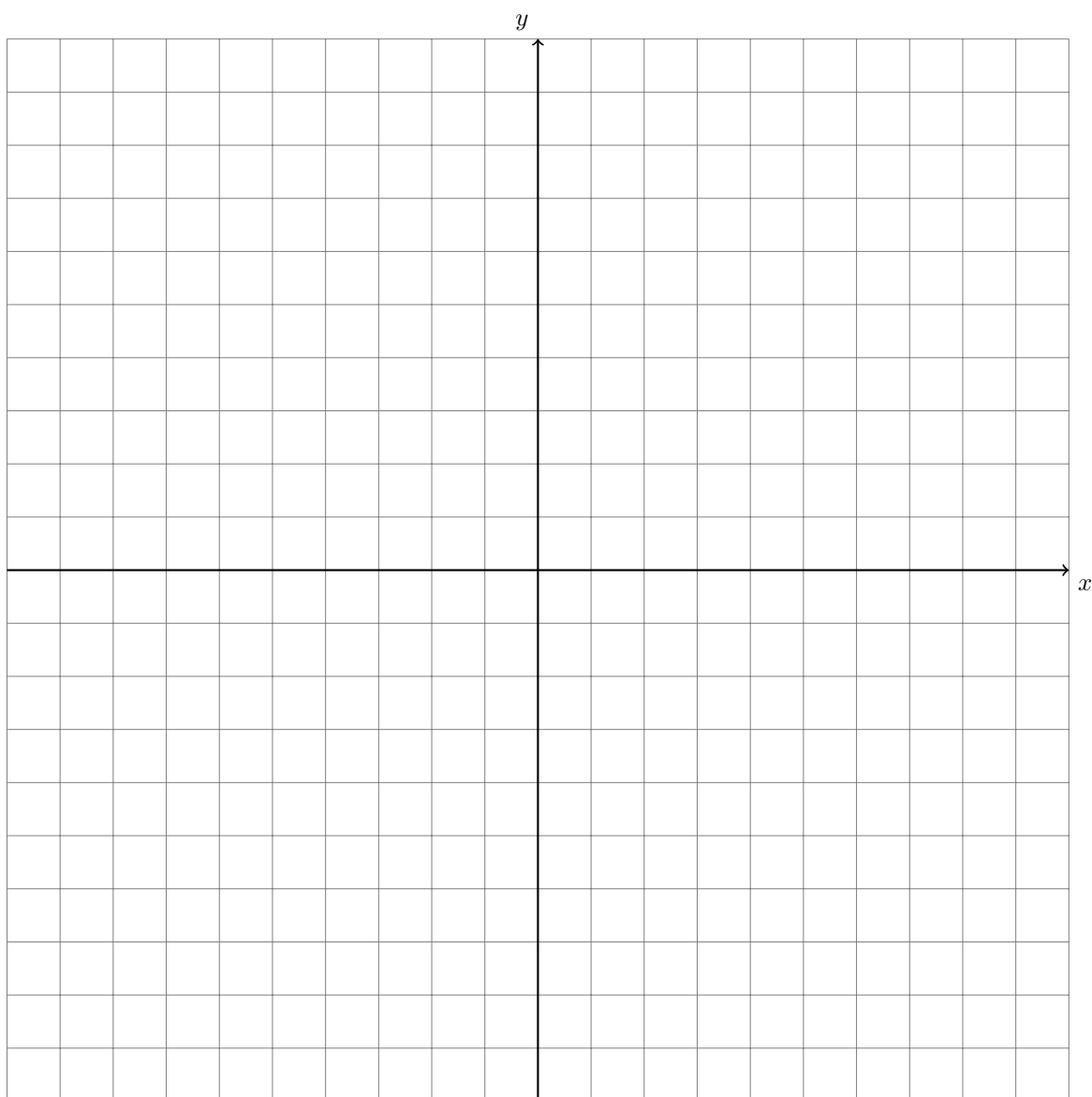Please note that these practice problems are intended for review purposes only; the actual exams may vary in format and content. Utilize them as study aids and consult the syllabus for precise details. Detailed solutions with explanations are available on my YouTube channel. - Robert Pearce
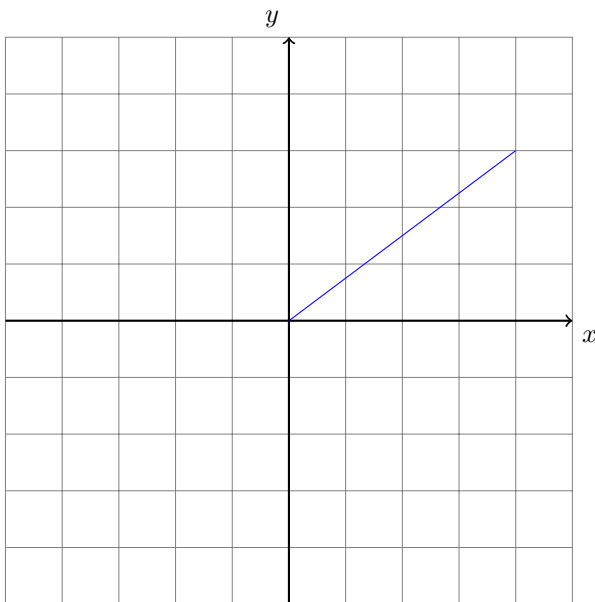
Name:

1. Plot the points: $(-3, 6), (-2, 0), (-2, -5)$

2. Find the distance between: $(0,0)$ and $(1,4)$

3. Find the midpoint of the line segment with points: $(3,-3)$ and $(7,5)$

4. Solve: $13 = 5 + 8(x-18)$

5. Find an equation of a line passing through: $(-3, 6)$ and $(-1, 7)$

6. Find the slope of the line.

7. Find an equation of a line that is perpendicular to the line $x - 9y = 4$; containing the point $(0, 3)$

8. Determine the domain of: $\frac{x-8}{x+70}$

9. Determine the domain of: $\sqrt{5x - 20}$

10. Find the product: $(3x - 5)(7x + 6)$

11. For the function $f(x) = 4x^2 + 3x - 4$ find:

a) $f(0)$

b) $f(2)$

c) $f(-2)$

d) $f(-x)$

e) $-f(x)$

f) $f(x+1)$

g) $f(5x)$

h) $f(x+h)$

12. Find the difference quotient of $f(x) = x^2 - 4x + 3$

13. Factor the polynomial: $-7x^2y^3 - 28xy^2 - 35xy$

14. Factor the polynomial by grouping: $3x^3 - 12x^2 + 4x - 16$

15. Factor the polynomial: $x^2 + 24x + 23$

16. Factor the polynomial: $-3x^2 + 2x + 8$

17. Factor the polynomial: $25x^2 - 64$

18. Factor the polynomial: $8x^3 + 27$

19. Rewrite the function: $y = \sqrt{x}$ but shifted down 2 units.

20. Given the function $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 3x + 2 & \text{if } x > 0 \end{cases}$

    a) $f(-1)$

    b) $f(0)$

    c) $f(3)$

21. Perform the operation and write the expression in standard form: i^3

22. Write as a pure imaginary number: $\sqrt{-45}$

23. Solve the following equation using the square root method: $(4y + 8)^2 = 64$

24. Solve the equation: $x^2 - 14x + 58 = 0$

25. Solve the equation: $25x^2 + 4 = 20x$

26. Add the polynomials: $(7 + 2x^3) + (5x^3 + 2)$

27. Subtract the polynomials: $(4d + 7) - (2d - 5)$

28. Multiply the polynomials: $(x + 2)(x - 5)$

29. Multiply the polynomials: $(2x - 2)(3x + 4)$

30. Add: $(3x^2 + 4x + 2) + (5x^2 - 2)$

31. Subtract: $(3x^2 + 1) - (4 + 4x^2)$

32. Multiply: $(x + 2)(x^2 + 3x - 5)$

33. Divide: $\frac{x^3 + 3x^2 - 5x + 4}{x - 2}$

34. Solve for x: $3x^2 + 4x = 0$

35. Solve for x: $2x^3 - 11x^2 + 10x + 8 = 0$

36. Find the domain: $\frac{x^3 + 2x^2}{x^2 + 3x + 2}$

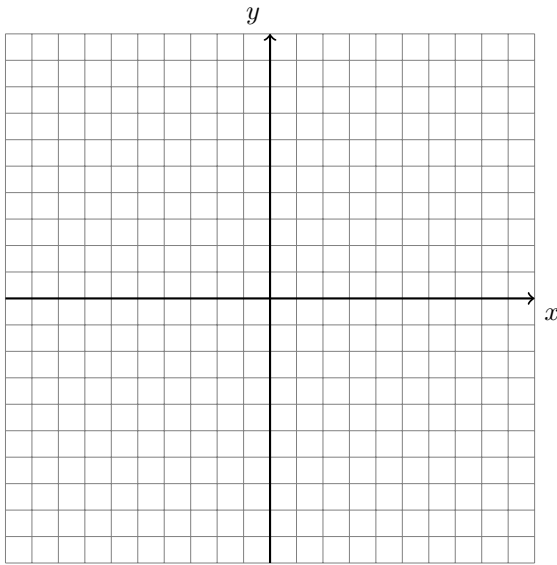37. Find the domain: $\frac{25 - x^2}{x^2 + 4x - 5}$

38. Identify any vertical, horizontal, or oblique asymptotes: $\frac{4x+5}{x+1}$

39. Identify any vertical, horizontal, or oblique asymptotes: $\frac{2x+5}{4x-3}$

40. Identify any vertical, horizontal, or oblique asymptotes: $\frac{x+2}{x^2-9}$

41. Identify any vertical, horizontal, or oblique asymptotes: $\frac{x^3+4x-5}{x^2+3x}$

42. Graph: $(x-2)^2(x+4)$

43. Simplify: $(6+4i)+(3-2i)$

44. Simplify: $(4+3i)(5-6i)$

45. Simplify: $(5+3i)(5-3i)$

46. Simplify the expression: $\frac{(-4)^3 x^8 (yz)^2}{(5)^2 xy^8 z^8}$

47. Simplify the expression: $\left(\frac{6x^{-8}}{7y^{-2}}\right)^{-3}$

48. Find the inverse of the function: $f(x) = \frac{8x+9}{3x-8}$

49. Rewrite exp $\to$ log: $16 = 4^2$

50. Rewrite log $\to$ exp: $\log_2(16) = 3$

51. Solve for x: $8^{-x+32} = 32^x$

52. Solve for x: $\log_2(4x + 7) = 4$

53. Evaluate the following without using a calculator: $\log_2(2^{63})$

54. Evaluate the following without using a calculator: $3^{\log_3(7)}$

55. Rewrite the expression as one logarithm: $6\log_3(U) + 5\log_3(V)$

56. Solve for x: $\log_2(x) = 3$

57. Solve: $\log(x) + \log(x - 15) = 2$

58. Simplify: $125^{-2/3}$

59. Rewrite with radicals: $(4b)^{4/7} - (9s)^{5/9}$

60. Solve: $e^{x^2} = e^{8x} \times \frac{1}{e^{15}}$

61. You place $4,000 in a bank account with 2.5% interest rate compounded monthly. How much will you have in the account after 4 years?

62. Kryptonite is a radioactive isotope that decays according to the function $A(t) = A_0 e^{-0.0244t}$, where A_0 is the initial amount present and A is the amount present at time t (in years). Assume we have a 400-gram sample of Kryptonite.

a) What is the decay constant k?

b) How much Kryptonite is left after 40 years?

c) When will only 300-grams of the Kryptonite be left?

d) What is the half-life of the Kryptonite?

The End.