

Summer Assignment

Please sketch or screenshot and print the graphs of the following functions and attach them to the back of the corresponding function. Put each on its own flashcard. You will need to memorize what these graphs look like.

1. $y^2 - x^2 = 9$

2. $y = \frac{1}{x+3} + 4$

3. $y = x^{2/3}$

4. $y = |x|$

5. $y = 4\sin x$

6. $y = 4\cos x$

7. $y = \sin 4x$

8. $y = \cos 4x$

9. $y = x$

10. $x^2 + y^2 = 16$

11. $(x - 2)^2 + (y + 4)^2 = 25$

12. $y = \frac{1}{x}$

13. $y = x^3$

$$y = -x^2$$

15. $y = e^x$

16. $y = e^{-x}$

17. $y = \ln x$

18. $y = 25x^2 + 9(y - 5)^2 = 225$

19. Create and graph a piecewise function $f(x)$ where $f(x) = x + 5$ for $x < -2$, $f(x) = 3$ for $-2 \leq x < 5$, and $f(x) = 28 - x^2$ when $x \geq 5$.

20. Create and graph a piecewise function $g(x)$ where $g(x) = -3$ for $x < -1$, $g(x) = x^2 - 4$ for $-1 \leq x \leq 2$, and $g(x) = \sqrt{x - 2}$ when $x > 2$.

For numbers 21-23, find the vertical asymptotes, horizontal asymptotes, slant asymptotes, and x-values of removable discontinuities (holes).

21. $y = \frac{1}{x - 5} + 7$

22. $y = \frac{x + 2}{x^2 - 4}$

23. $y = \frac{x^2 - 6x + 8}{x + 3}$

24. The graph of $f(x) = \frac{x^2 - 9}{x + 3}$ contains a removable discontinuity at $x = -3$. For what value of y could the point $(-3, y)$ fill in that hole?

25. Write an equation of the line with a slope of $2/3$ that passes through the point $(5, -2)$.

26. A line with a slope of 6 is tangent to the curve $y = x^2 - 4$ when $x = 3$. Write a equation of the line.

27. A "normal" line is perpendicular to a tangent line. Given the information in number 26, write an equation of the normal line.

28. To which axis, point, or line are odd functions symmetric?

29. To which axis, point, or line are even functions symmetric?

For numbers 30-32, find the x and y intercepts and tell whether the function is even, odd, or neither.

30. $y = \frac{1}{x}$

31. $y = 4x^3 + 8$

32. $y = x^2 - 4x$

Simplify for numbers 33 to 36.

33. $\ln e$

34. $\ln 1$

35. $\ln e^{3x^2}$

36. $e^{\ln(5x+6)}$

37. Solve for y in terms of x for $\frac{(x-2)^2}{7} + \frac{(y+3)^2}{8} = 1$.

38. Solve for y in terms of x for $\ln(y+1) = 6+x$.

39. Solve for y if $e^y = 17$.

40. Solve for y if $\ln(y+2) = \ln 35 - \ln y$.

41. Let $f(x) = x^2 + 2$ and $g(x) = 3x + 1$. Find

(a) $f(g(3))$

(b) $g(f(3))$

(c) $f(g(x))$

(d) $g(f(x))$

42. Given $f(x) = x^2 + 3x$, find $\frac{f(x+h) - f(x)}{h}$.

43. Find $\lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h}$

44. Find $\lim_{x \rightarrow 4} \frac{\frac{x}{4} - 1}{x - 4}$

45. Factor $5x^2 - 80$

46. Factor $x^2 + 11x + 30$

47. Factor $6x^2 + 13x + 6$

48. Factor $x^3 - 125$

49. Complete the square for $x^2 - 6x + 5$

50. Complete the square for $3x^2 + 18x - 11$

51. Find a common denominator and simplify $\frac{3}{x} + \frac{2x}{x+3} - \frac{4}{x-2}$

For numbers 52 to 55, solve without using a calculator, and use only radians, not degrees.

52. $3(x - 4) + 2x(x - 1) = 7$

53. $\sin x = \frac{\sqrt{3}}{2}, 0 \leq x < 2\pi$

54. $5^x = 17$

55. $\tan(2x) = \sqrt{3}, 0 \leq x < 2\pi$

56. Find the points of intersection using your graphing calculator, rounded to 3 decimal places, for $y = \sin\pi x$ and $y = \ln x$.

57. Find the points of intersection using your graphing calculator, rounded to 3 decimal places, for $y = e^{x^2}$ and $y = 3\cos x$

58. Find the points of intersection using your graphing calculator, rounded to 3 decimal places, for $y = x^2 - 9$ and $y = 2\sin x$.

59. Find the zeros using your calculator of $y = -6x^5 + 7x^4 - 12$.

60. Find the zeros using your calculator of $y = -4x^2 + 2x - 9$.