

Name: _____

1. Find the distance between: $(0, 0)$ and $(1, 4)$
2. Find an equation for a line containing: $(3, 6)$ and $(5, 5)$
3. Find the domain of: $\sqrt{5x - 20}$
4. Find the domain: $\frac{x-15}{x+3}$

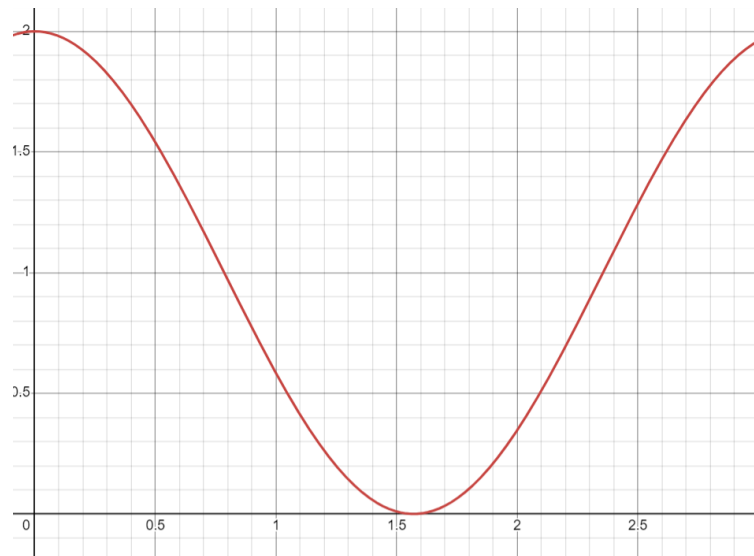
5. Find the domain of: $\sqrt{6x - 30}$

6. If $x = 5$, Find the value of $4x^2 - 4x + \frac{1}{x}$

7. Find the difference quotient of: $f(x) = x^2 - 4x + 7$

8. Find the asymptotes of: $f(x) = \frac{4x+5}{x+1}$

9. Look at the graph below and determine the intervals where the function is increasing and decreasing.



State the intervals where the function is:

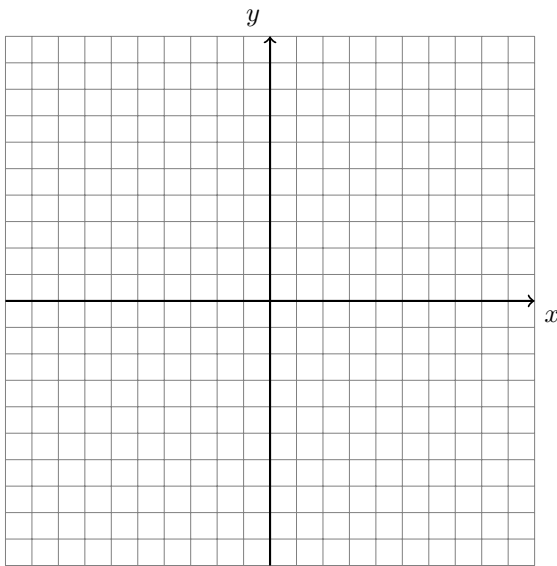
- **Increasing:** $(\dots, \dots) =$
- **Decreasing:** $(\dots, \dots) =$

10. Find the roots and their multiplicity: $f(x) = x^2 + 5x - 6$

11. Give that one zero is $x = 2$ find the remaining zeros for: $f(x) = x^3 - 6x^2 + 11x - 6$

12. Describe the end behavior of: $f(x) = -3(x+2)(x-3)(x+1)$

13. Graph the parabola: $f(x) = 2(x+3)^2 - 1$



(a) Vertex:

(b) x-int:

(c) Max or Min:

(d) Axis of Symmetry:

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

a) $f(-3)$

b) $f(0)$

c) $f(3)$

15. Find f and g so that $f \circ g = H$: $H(x) = (9x + 8)^6$

16. List the potential rational zeros: $f(x) = -9x^7 - 6x^6 + x + 3$

17. Rewrite exp \rightarrow log: $6.9 = a^8$

18. Rewrite log \rightarrow exp: $\log_7(\frac{1}{49}) = -2$

19. Expand: $\log_b(\frac{x^2z}{y^5})$

20. Write: $\log_7(\sqrt{x}) - \log_7(x^7)$ as a single log

21. Solve: $2\log_2(x - 2) + \log_2(16) = 6$

22. Solve: $5^{2x} = 5^{x+4}$

23. Use a calculator to evaluate the expression to 3 decimal places: $\ln(\frac{64}{45})$

24. Use a calculator to evaluate the expression to 3 decimal places: $\frac{\ln \frac{97}{38}}{-0.03}$

25. Use a calculator to evaluate the expression to 3 decimal places: $\frac{\ln 30 + \ln 15}{\log 30 + \log 15}$

26. Approximate to 3 decimal places using a calculator: $(1 + 0.09)^7$

27. Approximate to 3 decimal places using a calculator: $7.8(\frac{2}{3})^{2.9}$

28. 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 500-gram sample of Kryptonite.

- a) What is the decay constant k ?

- b) How much Kryptonite is left after 20 years?

- c) When will only 100-grams of the Kryptonite be left?

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