Finding Domain

Type of Function	Formal Definition	Practical Identification	Finding Domain
Exponential	An exponential function is of the form $f(x)=b^x$ where b is a real number, $b>0$ and $b\neq 1$.	Look for the variable to be in the exponent. The base of the exponent can be any real number $b>0$ and $b\neq 1$.	There are no restrictions to the domain of an exponential function. For that reason the domain of all exponential functions is all real numbers. In interval notation that is $(-\infty,\infty)$.
Logarithmic	A logarithmic function is of the form $y=\log_b g(x)$ and is equivalent to $b^y=g(x)$ and where b is a real number, $b>0$ and $b\neq 1$.	Look for the variable to be inside a logarithm.	The logarithm of a negative is undefined. The logarithm of zero is undefined. We are interested in where the function is defined which is only for positive values. We would like the expression inside the logarithm to be positive. Create an inequality to solve. The inequality is the expression inside the logarithm greater than zero. $g(x)>0$

Find the domain of the following functions. Use interval notation to state your answer.

1. $f(x)=\left(\frac{1}{4}\right)^x$

2. $g(x)=4*2^{x-3}+5$

3. $P(t)=200\,e^{0.05t}$

4. $R(x)=\log_2(x-7)$

5. $P(x)=2\ln(3-x)+5$

6. $Q(x)=\log(x^2-9)$

Find the domain of the following functions. Use interval notation to state your answer. These functions do not fit into a single function type.

7. $f(x)=\frac{\sqrt{x-9}}{x+2}$

8. $g(x)=\frac{x-7}{\sqrt[4]{5-x}}$

9. $h(x)=\sqrt{\frac{3}{2x+5}}$

10. $R(x)=\frac{5}{\sqrt[3]{7x-1}}$

11. $P(x)=\log_3 5^x$

12. $Q(x)=e^{\log_7 x}$

13. $f(x)=\frac{2^x}{x^2+1}$

14. $g(x)=\frac{1}{\sqrt{x+1}-2}$

15. $h(x)=\sqrt{\frac{1}{x-2}+1}$