

## Extra Practice for Solving Logarithms

Determine the domain of the following functions and then solve for  $x$ :

1.  $f(x) = \ln(x^2 - 2x) - \ln(5x - 12)$ , find when  $f(x) = 0$

2.  $f(x) = \log_2 6x - \log_2(4 - x)$ , find when  $f(x) = 3$

3.  $f(x) = \ln x + \ln(x + 3) - \ln(20 - 5x)$ , find when  $f(x) = 0$

4.  $f(x) = \ln(-x) + \ln(6 - x)$ , find when  $f(x) = 2$

5.  $f(x) = \log_2(x - 1) - \log_4 x$ , find when  $f(x) = 0$

6.  $f(x) = \ln(x - 1) + \ln(x + 8) - \ln((9 - x)(x - 1))$ , find when  $f(x) = 1$

7.  $f(x) = \ln((x - 9)(x + 8)) - \ln(4 - x)$ , find when  $f(x) = 0$

8.  $f(x) = \ln((7 - x)(x - 4)^2) - \ln((4 - x)(x - 10))$ , find when  $f(x) = -\ln 2$

**Solutions:**

1.  $x > 2.4$ , and  $f(x) = 0$  when  $x = 3$  or  $x = 4$
2.  $0 < x < 4$ , and  $f(x) = 3$  when  $x = \frac{16}{7}$
3.  $0 < x < 4$ , and  $f(x) = 0$  when  $x = 2$
4.  $x < 0$ , and  $f(x) = 2$  when  $x = 3 - \sqrt{9 + e^2} \approx -1.0$
5.  $x > 1$ , and  $f(x) = 0$  when  $x = \frac{1}{2}(3 + \sqrt{5}) \approx 2.6$
6.  $1 < x < 9$ , and  $f(x) = 1$  when  $x = \frac{9e-8}{1+e} \approx 4.4$
7.  $x < -8$ , and  $f(x) = 0$  when  $x = -\sqrt{76} \approx -8.7$
8.  $4 < x < 7$ , and  $f(x) = 0$  when  $x = 5.5$  or  $6$