1. \(\log_2(2x + 1) = 3\)
   \[2^3 = 2x + 1\]
   \[8 = 2x + 1\]
   \[-7 = 2x\]
   \[x = \frac{-7}{2}\]

2. \(\log_3(x^2 + 1) = 2\)
   \[x^2 + 1 = 3^2\]
   \[x^2 + 1 = 9\]
   \[x^2 = 8\]
   \[x = \pm 2\sqrt{2}\]

3. \(\frac{1}{2} \log_3(x) = 2 \log_3(2)\)
   \[\log_3 x^{\frac{1}{2}} = \log_3 2^2\]
   \[x^{\frac{1}{2}} = 4\] (Square both sides)
   \[x = 16\]

4. \(\log_2(x - 1) + \log_2 4 = 5\)
   \[\log_2 4x - 4 = 5\]
   \[4x - 4 = 32\]
   \[4x = 36\]
   \[x = 9\]

5. \(\log_3(x - 1)^2 = 2\)
   \[(x-1)^2 = 3^2\]
   \[x^2 - 2x + 1 = 9\]
   \[x^2 - 2x - 8 = 0\]
   \[(x-4)(x+2) = 0\]
   \[x = 4, x = -2\] (Both Work)

6. \(\ln(x) = 10\)
   \[e^{10} = x\]
   \[x = 22026.5\]

7. \(\ln(2 + x) = 1\)
   \[2 + x = e^1\]
   \[2 + x = 2.718\]
   \[x = 0.718\]

8. \(\log(2 + x) = 1\)
   \[2 + x = 10^1\]
   \[2 + x = 10\]
   \[x = 8\]

9. \(\log(x - 4) = 3\)
   \[x - 4 = 10^3\]
   \[x = 1004\]

10. \(\log(3x + 5) = 2\)
    \[3x + 5 = 10^2\]
    \[3x + 5 = 100\]
    \[3x = 95\]
    \[x = \frac{95}{3}\]

11. \(\log_3(2 - x) = 3\)
    \[2 - x = 3^3\]
    \[2 - x = 27\]
    \[-x = 25\]
    \[x = -25\]

12. \(\log_2(x^2 - x - 2) = 2\)
    \[x^2 - x - 2 = 2^2\]
    \[x^2 - x - 6 = 0\]
    \[(x-3)(x+2) = 0\]
    \[x = 3, x = -2\] (Both Work)
13. \(2 - \ln(3 - x) = 0\)
   \[\ln(3-x) = 2\]
   \[3-x = e^2\]
   \[3 - x = 7.389\]
   \[-x = 4.389\]
   \[x = -4.389\]

14. \(\log_2 3 + \log_2 x = \log_2 5 + \log_2(x - 2)\)
   \[\log_2 3x = \log_2 (5x - 10)\]
   \[3x = 5x - 10\]
   \[-2x = -10\]
   \[x = 5\]

15. \(2 \log(x) = \log 2 + \log(3x - 4)\)
   \[\log x^2 = \log (6x - 8)\]
   \[x^2 - 6x + 8 = 0\]
   \[(x-2)(x-4) = 0\]
   \[x = 2, x = 4\]

16. \(\log(x) + \log(x - 1) = \log(4x)\)
   \[\log (x^2 - x) = \log(4x)\]
   \[x^2 - x = 4x\]
   \[x^2 - 5x = 0\]
   \[x(x-5) = 0\]
   \[x = 0, x = 5\]

17. \(\log_5 x + \log_5(x + 1) = \log_5 20\)
   \[\log_5 (x^2 + x) = \log_5 20\]
   \[x^2 + x - 20 = 0\]
   \[(x+5)(x-4) = 0\]
   \[x = -5, x = 4\]
   \[x = 4\] (Doesn't work)

18. \(\log_5(x + 1) - \log_5(x - 1) = 2\)
   \[\log_5 \left(\frac{x+1}{x-1}\right) = 2\]
   \[\frac{x+1}{x-1} = 5^2\]
   \[x+1 = 25, x+1 = 25x - 25\]
   \[x = \frac{13}{12}\]

19. \(\log(x) + \log(x - 3) = 1\)
   \[\log(x^2 - 3x) = 1\]
   \[x^2 - 3x = 10^1\]
   \[x^2 - 3x - 10 = 0\]
   \[(x-5)(x+2) = 0\]
   \[x = 5, x = -2\] (Doesn't work)

20. \(\log_9(x - 5) + \log_9(x + 3) = 1\)
   \[\log_9 \left(\frac{x^2 - 2x - 15}{x + 3}\right) = 1\]
   \[\frac{x^2 - 2x - 15}{x + 3} = 9^1\]
   \[\frac{x^2 - 2x - 15}{x + 3} = 9\]
   \[x^2 - 2x - 24 = 0\]
   \[(x-6)(x+4) = 0\]
   \[x = 6, x = -4\] (Doesn't work)