3. $\log_7(y^2 - 2) = \log_7(2)$

4. $\ln(2x) + \ln(x - 3) = \ln 8$

★ **Logarithm = Constant**

Strategy: ① Condense ② Convert to exponential form.

Example 3: Solve for x. Be sure to always check for extraneous solutions.

$\log_2(2x) + \log_2(x - 1) = 4$

$\log_2(2x^2 - 2x) = 4$

$2^4 = 2x^2 - 2x$

$2x^2 - 2x - 16 = 0$

$2(x^2 - x - 8) = 0$

$x = \frac{1 \pm \sqrt{1+32}}{2}$

$x = \frac{1+\sqrt{33}}{2}; \frac{1-\sqrt{33}}{2}$ extraneous

Practice: Solve for the variable in each equation. Be sure to check for extraneous solutions.

1. $\log_5(3p) + \log_5(2p + 4) = 2$

2. $\log(4w) + \log(w + 3) = 3$

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3. $\log_9(y) - \log_9(y - 2) = 2$

4. $\log(100r) - \log(r - 15) = -1$

5. $\log_2(3x) - \log_2(x - 9) = -5$

6. $\log_4(2s) - \log_4(s + 1) = -2$

7. $\ln(4x + 3) = 3$

8. [illegible] = 9

$\log_e(4x+3) = 3$

$e^3 = 4x + 3$

$e^3 - 3 = 4x$

$x = \frac{e^3 - 3}{4} \approx 4.2714$

① $p = \frac{6+\sqrt{186}}{6}$

$p = \frac{6-\sqrt{186}}{6}$ (extr.)

② $w = \frac{-3+\sqrt{1009}}{2}; \frac{-3-\sqrt{1009}}{2}$ (extr.)

③ $y = 81/40$

④ $r = \frac{-5}{333}$ (extr.)
so no real solution!

⑤ $x = -9/5$ (extr.)
no solution

⑥ $s = 1/31$

⑨ $\frac{e^7-3}{2} \approx 546.8166$

Apr 28-8:29 AM