PROBLEMS AND SOLUTIONS - SOLVING LOGARITHMIC EQUATIONS
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Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

PLEASE NOTE THAT YOU CANNOT ALWAYS USE A CALCULATOR ON THE ACCUPLACER - COLLEGE-LEVEL MATHEMATICS TEST! YOU MUST BE ABLE TO DO SOME PROBLEMS WITHOUT A CALCULATOR!

Problem 1:

Solve $\log_2(x + 3) = 2$. Only find solutions that produce REAL numbers, except $0$, in the original equation when substituting for $x$.

Problem 2:

Solve $\log(x - 1) - \log(x + 1) = 1$. Only find solutions that produce REAL numbers, except $0$, in the original equation when substituting for $x$.

Problem 3:

Solve $\ln x + \ln(2x - 1) = 2$. Only find solutions that produce REAL numbers, except $0$, in the original equation when substituting for $x$! Round to 4 decimal places.

Problem 4:

Solve $\log(4x + 2x^2) = \log(3x^2)$. Only find solutions that produce REAL numbers, except $0$, in the original equation when substituting for $x$!

This logarithmic equation contains only logarithmic expressions. Therefore, we can discard the word $\log$ on either side, leaving us with an algebraic equation.

Problem 5:

Solve $\log(2x - 1) = \log(4x + 3) - \log x$. Only find solutions that produce REAL numbers, except $0$, in the original equation when substituting for $x$!
Problem 6:
Solve $\log(x + 4) - \log x = \log(x + 2)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$! Round to 4 decimal places.

Problem 7:
Solve for $x$: $2 \ln x = \ln(2 - x) + \ln(4 - x)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$!

Problem 8:
Solve $\log(x - 3) = \log(-x)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$!

Problem 9:
Solve $\log(3 - \frac{1}{2} x) = \log(-x)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$!

Problem 10:
Solve $\log x = \log(-5x - 6)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$!

Problem 11:
Solve $2 \log x = \log(-5x - 6)$. Only find solutions that produce REAL numbers, except 0, in the original equation when substituting for $x$!

Problem 12:
A medical technologist creates a reagent with a $pH$ of 7.48. Find the concentration of hydrogen ions $[H^+]$ in the reagent using the formula $pH = -\log[H^+]$. Express your answer in Scientific Notation rounded to two decimal places.
You can find detailed solutions below the link for this problem set!

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<tr>
<td>1.</td>
<td><strong>13</strong></td>
<td>2. No solutions</td>
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<td>4.</td>
<td><strong>4</strong></td>
<td>5. <strong>3</strong></td>
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<td>7.</td>
<td><strong>4/3</strong></td>
<td>8. No solutions</td>
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<td>10.</td>
<td><strong>-3, -2</strong></td>
<td>11. No solutions</td>
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<td>12. <strong>3.31 \times 10^{-8}</strong></td>
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