Practice:Solving Logs Mixed Review Math 3

**Directions:** Solve each of the following logarithms. Show all work on a separate sheet of paper.

1. log3(4 – *x*) = log3(*x* + 8)
2. log4(*x* + 2) = log4(55)
3. log2(2*x* + 1) = log2(15)

1. log5(*x* + 1) = log5(2*x* + 7)
2. log3(*x* + 2) = log3(3*x* – 5)
3. log7(*x* + 3) = log7(5*x* – 8)

1. log5(–*x* + 1) = log5(5 + *x*)
2. log8(2*x* + 4) = log8(60)
3. log4(*x* + 1) = log4(10)

1. log4(3*x* + 1) = log4(2*x*)
2. log2(*x* + 5) = –1
3. log3(*x* – 2) = 3

1. log2(2 + 3*x*) = 0
2. log2(2*x* + 1) = 4
3. log4(17*x* – 4) = 3

1. log4(*x* – 1) = –2
2. 2 • log4(*x* + 3) = log4(25)
3. 3 • log2(*x* + 1) = log2(27)

1. log2(*x* + 2) + log2(*x* + 1) = log2(*x*) + log2(*x* + 4)
2. log2(*x*) + log2(*x* + 1) = log2(–4*x* – 6)

1. log2(*x* – 2) + log2(*x* – 5) = log2(*x* – 1) + log2(*x* + 6)
2. log2(*x*) + log2(*x* – 6) = log2(2*x* – 7)

1. log2(*x* – 2) + log2(*x* – 8) = log2(*x* + 1) + log2(*x* – 9)
2. 2 • log3(*x* + 1) = log3(*x* + 2) + log3(*x* – 3)

**Challenge Problems**

1. Solve: log2(*x*) – log2($\sqrt{x}$– 1) = 2.
2. Solve: log5(*x* – 3) = log5($\sqrt{x+3}$ )

1. **Correct the Error:** There is an error in the student work shown below:

2•log2(x + 1) = log29

log2(x + 1)2 = log29

(x + 1)2 = 9

x + 1 = 3 or x + 1 = –3

x = 2 or x = –4

What is the error? Explain how to solve the problem.

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3. log2(2*x* + 1) = log2(15)

 *x* = –2 *x* = 53 *x* = 7

1. log5(*x* + 1) = log5(2*x* + 7)
2. log3(*x* + 2) = log3(3*x* – 5)
3. log7(*x* + 3) = log7(5*x* – 8)

 no solution *x* = 3.5 *x* = 11/4

1. log5(–*x* + 1) = log5(5 + *x*)
2. log8(2*x* + 4) = log8(60)
3. log4(*x* + 1) = log4(10)

 *x* = –2 *x* = 28 *x* = 9

1. log4(3*x* + 1) = log4(2*x*)
2. log2(*x* + 5) = –1
3. log3(*x* – 2) = 3

 no solution *x* = –4.5 *x* = 29

1. log2(2 + 3*x*) = 0
2. log2(2*x* + 1) = 4
3. log4(17*x* – 4) = 3

 *x* = –1/3  *x* = 7.5  *x* = 4

1. log4(*x* – 1) = –2
2. 2 • log4(*x* + 3) = log4(25)
3. 3 • log2(*x* + 1) = log2(27)

 *x* = 17/16 *x* = 2 *x* = 2

1. log2(*x* + 2) + log2(*x* + 1) = log2(*x*) + log2(*x* + 4)
2. log2(*x*) + log2(*x* + 1) = log2(–4*x* – 6)

 *x* = 2 no solution

1. log2(*x* – 2) + log2(*x* – 5) = log2(*x* – 1) + log2(*x* + 6)
2. log2(*x*) + log2(*x* – 6) = log2(2*x* – 7)

 no solution *x* = 7

1. log2(*x* – 2) + log2(*x* – 8) = log2(*x* + 1) + log2(*x* – 9)
2. 2 • log3(*x* + 1) = log3(*x* + 2) + log3(*x* – 3)

 *x* = 12.5 no solution

**Challenge Problems**

1. Solve: log2(*x*) – log2($\sqrt{x}$– 1) = 2.
2. Solve: log5(*x* – 3) = log5($\sqrt{x+3}$ )

 *x* = 4  *x* = 6

1. **Correct the Error:** There is an error in the student work shown below:

2•log2(x + 1) = log29

log2(x + 1)2 = log29

(x + 1)2 = 9

x + 1 = 3 or x + 1 = –3

x = 2 or x = –4

What is the error? Explain how to solve the problem.

*x* = –4 cannot be a solution to the equation; the inside of a logarithm cannot be negative.