

## PUZZLE SHEET

# Logarithms – Solving equations 1

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*Romain Rolland – author*

## Questions

Solve the following equations. (Remember,  $\log a$  is possible only if  $a > 0$ .)

1  $4^{5x-2} - 64 = 0$

6  $\log_2(3x + 20) = 5$

2  $3^{x-5} + 3 = 30$

7  $\log_2(x - 1) + 1 = \log_2(x + 7)$

3  $3^{2x} + 81 = 2 \times 3^{x+2}$

8  $\log(3x - 1) = 5 \log(2)$

4  $8^{x-3} = 4^{x-1}$

9  $\log_3(x - 1) - \log_5(x + 4) + \log_5(2) = 0$

5  $\log_3(x - 9) = 4$

10  $2^{2x} + 2 = 2^{x+1} + 2^x$

$$11 \quad 3^{2x} - 3^{x+2} = 3^{x+1} - 27$$

$$13 \quad 2^{2x} + 144 \times 2^{x+1} = 8192$$

$$12 \quad [\log_2(x - 3)]^2 + 32 = \log_2(x - 3)^{12}$$

## Solutions

**A**  $x = 11$

**C**  $x = 1$

**D**  $x = 9$

**E**  $x = 7$

**H**  $x = 5$  or  $x = 6$

**I**  $x = 6$

**N**  $x = 3$

**O**  $x = 0$  or  $x = 1$

**R**  $x = 1$  or  $x = 2$

**S**  $x = 4$

**T**  $x = 2$

**W**  $x = 8$

**Y**  $x = 5$  or  $x = 8$