Logarithm Set 02

1. If $x^2+y^2=6xy$ then show that $2\log_{10}(x+y)= \log_{10}x+ \log_{10}y+ 3\log_{10}2$
2. Find 'b' if : $\log_e 2 \times \log_b 625 = \log_{10}16 \times \log_e 10$
3. Find the value of $\frac{1+2\log_3 2}{(1+\log_3 2)^2} + (\log_6 2)^2$
4. Find the value of x

   $\text{Log}_x 2 \times \log_{2x} 2 = \log_x 2$
5. Solve for x: $6(\log_x 2 - \log_4 x) + 7=0$
6. Simplify: $\frac{81^{\frac{1}{\log_5 9}}+3^{\frac{1}{\log_{\sqrt{6}} 3}}}{409} \times \{(\sqrt{7})^{\frac{2}{\log_{25} 7}} - (125)^{\log_{25} 6}\}$
7. Find the value of $(\log_{10}2)^3 + \log_{10}8 \log_{10}5+ (\log_{10}5)^3$
8. Find the value of x: $\log_4(2^x+48) + 1 =x$
9. Find x: $3^{\log_a x} + 3 \times x^{\log_a 3} = 2$
10. Solve for x, $\log(x+3)+\log(x-3)=\log 27$
11. Prove that $\log_{ab}x=\log_a x \times \log_b x / \log_a x + \log_b x$
12. Prove that $\frac{\log_a n}{\log_{ab} n}=1+\log_a b$
13. Prove that $\frac{1}{\log_a abc} + \frac{1}{\log_b abc} + \frac{1}{\log_c abc}=1$
14. Prove that $(\log_a n \times \log_b n) + (\log_a n \times \log_c n) + (\log_b n \times \log_c n) = \frac{\log_a n \times \log_b n \times \log_c n}{\log_{abc} n}$
15. If $\frac{\log_a N}{\log_c N}=\frac{\log_a N - \log_b N}{\log_b N - \log_c N}$ where N>0 then prove that $b^2=ac$
16. If in a right angled triangle, a and b are the lengths of sides and c is the length of hypotenuse, then show that

    $\log_{c+b}a + \log_{c-b}a = 2\log_{c+b}a \cdot \log_{c-b}a$

Answer

2) 5
3) 1
4) 1
5) 8 and $1/\sqrt{8}$
6) 1
7) 1
8) 4
9) $x = a^{-\log_3 2}$
10) 6