Single Logarithm and Expansion

Expand each expression :

1) $\log_a \left(\dfrac{x^2\, y^3}{m\, n} \right)$ = _____

2) $\log_3 \sqrt{5a^7}$ = _____

3) $5 \log_4 \left(\dfrac{a^2\, b}{n^3} \right)$ = _____

4) $\log_2 \left(\dfrac{b}{c} \right)^4$ = _____

5) $4 \log_a \left(\dfrac{p^6\, q^3}{r^2\, s} \right)$ = _____

Rewrite each expression in single logarithm:

6) $(4 \log_5 x + 5 \log_5 y) - \log_5 z$ = _____

7) $(3 \log_7 m + 12 \log_7 n) - 3 \log_7 p$ = _____

8) $\dfrac{1}{3} (4 \log_2 s + \log_2 t)$ = _____

9) $40 \log_3 t - (8 \log_3 w + 16 \log_3 x)$ = _____

10) $6 (\log_8 5 - \log_8 m)$ = _____

Single Logarithm and Expansion

Sheet 1

Expand each expression :

1) $\log_a \left(\dfrac{x^2 \, y^3}{m \, n} \right)$ = $(2 \log_a x + 3 \log_a y) - (\log_a m + \log_a n)$

2) $\log_3 \sqrt{5a^7}$ = $\dfrac{1}{2} (\log_3 5 + 7 \log_3 a)$

3) $5 \log_4 \left(\dfrac{a^2 \, b}{n^3} \right)$ = $(10 \log_4 a + 5 \log_4 b) - 15 \log_4 n$

4) $\log_2 \left(\dfrac{b}{c} \right)^4$ = $4 (\log_2 b - \log_2 c)$

5) $4 \log_a \left(\dfrac{p^6 \, q^3}{r^2 \, s} \right)$ = $(24 \log_a p + 12 \log_a q) - (8 \log_a r + 4 \log_a s)$

Rewrite each expression in single logarithm:

6) $(4 \log_5 x + 5 \log_5 y) - \log_5 z$ = $\log_5 \left(\dfrac{x^4 \, y^5}{z} \right)$

7) $(3 \log_7 m + 12 \log_7 n) - 3 \log_7 p$ = $3 \log_7 \left(\dfrac{m \, n^4}{p} \right)$

8) $\dfrac{1}{3} (4 \log_2 s + \log_2 t)$ = $\log_2 \sqrt[3]{s^4 t}$

9) $40 \log_3 t - (8 \log_3 w + 16 \log_3 x)$ = $8 \log_3 \left(\dfrac{t^5}{w \, x^2} \right)$

10) $6 (\log_8 5 - \log_8 m)$ = $\log_8 \left(\dfrac{5}{m} \right)^6$