Solving exponential Equations assignment

1. $9^{3x-7} = 9^{5-x}$ [powers are equal if base is same).

$3x-7 = 5-x$

$4x = 12 \Rightarrow x = 3$

2. $2^{w+4} \cdot 2^{4w+6} = 2^{2w+1}$

$2^{(w+4+4w+6)} = 2^{2w+1}$

$5w+10 = 2w+1$

$3w = -9$

$w = -3$

3 $8^{6y+4} = 64 = 8^2$

$6y+4 = 2.$

$6y = -2 \Rightarrow y = -1/3$

4. $\frac{1}{5} = 5^{2c+3} \Rightarrow \frac{1}{5} = 5^{-1}$

$\therefore 5^{-1} = 5^{2c+3} \Rightarrow -1 = 2c+3$

$2c = -4$

$c = -2.$

5. $\frac{1}{27} = 3^{4m-1}$

$\frac{1}{27} = \frac{1}{3^3} = 3^{-3} \Rightarrow 3^{-3} = 3^{4m-1}$

$-3 = 4m-1$

$-2 = 4m$

$m = -1/2$

6. $216 = 6^{2r-11}$

$6^3 = 6^{2r-11}$

$3 = 2r - 11$

$2r = 14$

$r = 7$

7. $2^{3k-1} \cdot 2^{5k-7} = 16$

$2^{(3k-1)+(5k-7)} = 2^4$

$2^{8k-8} = 2^4 \Rightarrow 8k - 8 = 4$

$8k = 12$

$k = 1.5$

8. $4^n \cdot 4^{2n-9} = 64$

$4^{n+2n-9} = 4^3$

$3n - 9 = 3$

$3n = 12 \Rightarrow n = 4$