USE THE PROPERTIES OF LOGARITHMS TO FIND THE EXACT VALUE

$$e^{\ln 8} = 8$$

$$\log_8 16 - \log_8 2 = \log_8 \frac{16}{2} = \log_8 8 = 1$$

$$5^{\log_5 6 + \log_5 7} = 5^{\log_5 6\cdot 7} = 5^{\log_5 42} = 42$$

WRITE EACH EXPRESSION AS A SUM AND/OR DIFFERENCE OF LOGARITHMS, EXPRESS EXPONENTS AS FACTORS

$$\log_2 \left[\frac{\sqrt{x-5}\,(x^2+1)}{(x-3)}\right]^2 = 2\log_2\left(\frac{\sqrt{x-5}\cdot(x^2+1)}{(x-3)}\right)$$

$$= 2\left[\log_2 (x-5)^{\frac{1}{2}}(x^2+1) - \log_2 (x-3)\right]$$

$$= 2\left[\frac{1}{2}\log_2(x-5) + \log_2(x^2+1) - \log_2(x-3)\right]$$

$$= \log_2(x-5) + 2\log_2(x^2+1) - 2\log_2(x-3)$$

WRITE EACH EXPRESSION AS A SINGLE LOGARITHM.

$$3\log_a u - 5\log_a v = \log_a u^3 - \log_a v^5 = \log_a \frac{u^3}{v^5}$$

$$8\log_2\sqrt{3x-2} - \log_2\left(\frac{4}{x}\right) + \log_2 4 = \log_2 \frac{\left(\sqrt{3x-2}\right)^8}{\frac{4}{x}\cdot 4}$$

$$= \log_2 \frac{x\left(\sqrt{3x-2}\right)^8}{16}$$