$$\ln x - 3[\ln(x-5)+\ln(x+5)]$$

$$= \ln x - 3\ln[(x-5)(x+5)]$$

$$= \ln x - 3\ln(x^2-25)$$

$$= \ln x - \ln(x^2-25)^3$$

$$= \boxed{\ln \frac{x}{(x^2-25)^3}}$$

$$\log_a \sqrt{\frac{a^6 b^8}{a^2 b^5}} = \log_a (a^4 b^3)^{1/2}$$

$$= \log_a (a^2 b^{3/2})$$

$$= \log_a a^2 + \log_a b^{3/2}$$

$$= \boxed{2 + \frac{3}{2}\log_a b}$$

$$\log_a \sqrt{\frac{a^6b^8}{a^2b^5}} = \log_a \left(\frac{a^6b^8}{a^2b^5}\right)^{1/2}$$

$$= \frac{1}{2}\log_a \frac{a^6b^8}{a^2b^5}$$

$$= \frac{1}{2}\left[\log_a a^6 + \log_a b^8 - \log_a a^2 - \log_a b^5\right]$$

$$= \frac{1}{2}\left[6 + 8\log_a b - 2 - 5\log_a b\right]$$

$$= \frac{1}{2}\left[4 + 3\log_a b\right]$$

$$= 2 + \frac{3}{2}\log_a b$$

Suppose y varies jointly with x and the square of z and inversely with the square root of w.
Write an equation of variation if $y=3$ when $x=6$, $z=2$ and $w=4$.

$$y = \frac{kxz^2}{\sqrt{w}} \qquad k = \frac{6}{24} \qquad y = \frac{1xz^2}{4\sqrt{w}}$$

$$3 = \frac{k\cdot 6\cdot(2)^2}{\sqrt{4}} \qquad k = \frac{1}{4}$$

$$3 = \frac{k\cdot 24}{2} \qquad 6 = k\cdot 24$$

$$x^3-2x^2<5x-6$$

$$x^3-2x^2-5x+6<0$$

$$\frac{1,2,3,6}{1}=\pm1,\pm2,\pm3,\pm6$$

$$\begin{array}{r|rrrr} 1 & 1 & -2 & -5 & 6 \\ & \downarrow & 1 & -1 & -6 \\ \hline & 1x^2 & -1x & -6 & \boxed{0} \end{array}$$

$(x^2-x-6)(x-1)$

$(x-3)(x+2)(x-1)$

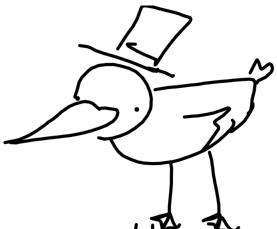
$-$ $+$ $-$ $+$

-2 1 3

-3 0 2 4

$(-\infty,-2)\cup(1,3)$

$$\frac{(x-1)^3(x-3)(x+2)}{(x+1)(x+10)^2}\geq 0$$



-12 -5 $-3/2$ 0 2 4

-10 -2 -1 1 3

$+$ $+$ $-$ $+$ $-$ $+$

$(-\infty,-10)\cup(-10,-2]\cup(-1,1]\cup[3,\infty)$