Find derivative.
Use ID.

$$\ln(xy) + 5x = 30$$

$$\ln x + \ln y + 5x = 30$$

$$\frac{1}{x} + \frac{1}{y}\frac{dy}{dx} + 5 = 0$$

$$y \cdot \frac{1}{y}\frac{dy}{dx} = \left(\frac{-1}{x} - 5\right) \cdot y$$

$$\frac{dy}{dx} = y\left(\frac{-1}{x} - 5\right)$$

⑦ Find $\frac{dy}{dx}$ using log differentiation.

$\ln$ $y = \dfrac{(x+1)(x+2)}{(x-1)(x-2)}$

1) Take $\ln$ both sides
2) rewrite expanded
3) take derivative
4) solve for $\frac{dy}{dx}$
5) substitute y

$$\ln y = \ln(x+1) + \ln(x+2) - \ln(x-1) - \ln(x-2)$$

$$\frac{1}{y}\frac{dy}{dx} = \frac{1}{x+1} + \frac{1}{x+2} - \frac{1}{x-1} - \frac{1}{x-2}$$

$$\frac{dy}{dx} = y\left(\frac{1}{x+1} + \frac{1}{x+2} - \frac{1}{x-1} - \frac{1}{x-2}\right)$$

$$\frac{dy}{dx} = \frac{(x+1)(x+2)}{(x-1)(x-2)}\left(\frac{1}{x+1} + \frac{1}{x+2} - \frac{1}{x-1} - \frac{1}{x-2}\right)$$