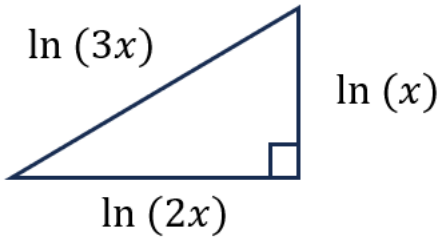
Term 1 Week 6

1. Solve for x:



2. Solve for x:

$$\log_5(x) + \log_7(x) = \log_{25}(x)$$

3. Show that the equation $4x^2 - y^2 - 16hx + 2hy + 15h^2 - 4a^2 = 0$, where h and a are positive constants, represents a hyperbola.

   If the tangent to this hyperbola at the point (p, q) is parallel to the straight line $y = (e^2 - 1)x$, where e is the eccentricity of the hyperbola, show that $p - q = h$.

   Note: the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is given by $e^2 = 1 + \frac{b^2}{a^2}$