Find the total differential of the following functions:

1. $y = x^3 \ln kx$, for k a constant

Solution

$$dy = 3x^2 \ln kx \, dx + \frac{x^3}{kx} k \, dx$$

2. $y = \frac{\sin(7v+2)}{u^3}$

Solution

$$y = \sin(7v + 2) \, u^{-3} \tag{1}$$
$$dy = 7u^{-3} \cos(7v + 2) \, dv - 3 \sin(7v + 2) u^{-4} du \tag{2}$$