2.)

a)

$z = \sqrt{x-y} + \ln\sqrt{xy}$

$u = (x-y)^{\frac{1}{2}}$

$u' = \frac{1}{2}(x-y)^{-\frac{1}{2}}$

$v = x-y$

$v' = 1$

$[u(v)]' = u' \cdot v'$

$[\ln(u)]' = \frac{1}{u} \cdot u'$

$\frac{1}{\sqrt{xy}} \cdot \frac{1}{2}(xy)^{-\frac{1}{2}} \cdot y$

$\frac{y}{2\sqrt{xy}\sqrt{xy}}$

$\frac{1}{2x}$

~~$\frac{y}{2\sqrt{x-y}} = f_x$~~

$\frac{1}{2\sqrt{x-y}}$

$f_x = \frac{1}{2\sqrt{x-y}} + \frac{1}{2x}$