Q (1-c):

$$\hat{\beta}_1 = \frac{s_{xy}}{s_x^2}$$

$$= \frac{r_{xy} \cdot s_x \cdot s_y}{s_x^2}$$

$$= \frac{r_{xy} \cdot s_y}{s_x}$$

$$r_{xy} = \frac{s_{x \cdot y}}{s_x \cdot s_y}$$

$$\Rightarrow s_{x \cdot y} = r_{xy} \cdot s_x \cdot s_y$$

So, $r_{xy} = \hat{\beta}_1 \times (s_x / s_y)$