

$$1a) y = 3\sqrt{x-1} + 2 = 3(x-1)^{1/2} + 2$$

$$x = 3\sqrt{y-2} + 2$$

$$\left(\frac{x-2}{3}\right)^2 = (\sqrt{y-2})^2$$

$$\left(\frac{x-2}{3}\right)^2 = y-2$$

$$y = \left(\frac{x-2}{3}\right)^2 + 2$$

$$y' = 2 \left(\frac{x-2}{3}\right) \cdot \frac{1}{3} = \frac{2}{3} \left(\frac{x-2}{3}\right)$$

$$y'(4) = \frac{2}{3} \left(\frac{4-2}{3}\right) = \frac{2}{3} \cdot \frac{2}{3} = \boxed{\frac{4}{9}}$$

$$1b) 4 = 3\sqrt{x-1} + 2$$

$$2 = 3\sqrt{x-1}$$

$$\left(\frac{2}{3}\right)^2 = (\sqrt{x-1})^2$$

$$\frac{4}{9} = x-1$$

$$x = \frac{13}{9} \checkmark$$

$$f\left(\frac{13}{9}, 4\right)$$

$$f'\left(4, \frac{13}{9}\right)$$

$$f'(x) = \frac{3}{2} (x-1)^{-1/2}$$

$$f'\left(\frac{13}{9}\right) = \frac{3}{2} \left(\frac{13}{9}-1\right)^{-1/2}$$

$$\frac{3}{2} \left(\frac{1}{\sqrt{\frac{4}{9}}}\right) = \frac{3}{2} \cdot \frac{3}{2}$$

$$\frac{1}{f'(f^{-1}(4))}$$

$$\frac{1}{f'\left(\frac{13}{9}\right)} = \frac{1}{\frac{9}{4}} = \boxed{\frac{4}{9}}$$

$$= \frac{9}{4}$$

$$\frac{1}{K'(K^{-1}(4))}$$

$$4 = 4x^3 + 2x - 5$$
$$0 = 4x^3 + 2x - 9$$
$$x = 1.184$$

$$\frac{1}{K'(1.184)} = \frac{1}{18.822} = \boxed{.053}$$

$$K'(x) = 12x^2 + 2$$
$$K'(1.184) = 18.822$$

$$\frac{1}{h'(h^{-1}(2))} = \frac{1}{h'(3)} = \frac{1}{1} = \boxed{1}$$

$$\frac{1}{m'(m^{-1}(-\frac{1}{2}))} = \frac{1}{m'(-1)} = \boxed{\frac{1}{-2}}$$