Q2 $y_1(x) = 2x+1$

$$y_2(x) = \frac{2x}{(1+0.2x)}$$

$$y_1 - y_2 = (2x+1) - \left(\frac{2x}{1+0.2x}\right)$$

$$= \frac{2x + 0.4x^2 + 1 + 0.2x - 2x}{(1+0.2x)}$$

$$y_1 - y_2 = \frac{0.4x^2 + 0.2x + 1}{(1+0.2x)}$$

$$\frac{1}{y_1 - y_2} = \frac{1+0.2x}{0.4x^2+0.2x+1} = f(x)$$

Q3 Circle: $x^2 + y^2 = 4$
Parabola: $x^2 - y = 1$ } Intersect?
$\hookrightarrow y = x^2 - 1$

$$x^2 + (x^2-1)^2 = 4$$
$$x^2 + x^4 - 2x^2 + 1 = 4$$
$$x^4 - x^2 + 1 = 4$$
$$x^4 - x^2 - 3 = 0$$

$x^2 = t$ (let)

$$t^2 - t - 3 = 0$$
$$t = \frac{1 \pm \sqrt{1+12}}{2} = \frac{1 \pm \sqrt{13}}{2}$$

$$t = \frac{1+\sqrt{13}}{2} \quad \text{or} \quad \frac{1-\sqrt{13}}{2}$$

$\because \quad x^2 = t \quad$ & $\quad t \geq 0$

$$t \neq \frac{1-\sqrt{13}}{2}$$

$$\text{So, } t = \frac{1+\sqrt{13}}{2} = x^2$$

$$x = \pm \sqrt{\frac{1+\sqrt{13}}{2}}.$$

$$\text{So, } y = x^2 - 1 = \frac{1+\sqrt{13}}{2} - 1 = \frac{-1+\sqrt{13}}{2}.$$