

3) Area Between $f(x) = (x-1)^3$ and $g(x) = x-1$

$$(x-1)^3 = x-1$$

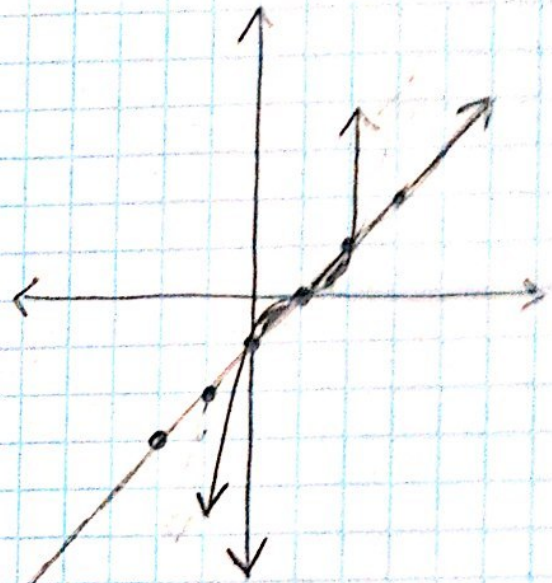
$$x^3 - 3x^2 + 3x - 1 = x - 1$$

$$x^3 - 3x^2 + 2x = 0$$

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

$$x(x-1)(x-2) = 0$$

$$x = 0, 1, 2$$



$$\int_0^1 (x^3 - 3x^2 + 3x - 1 - x + 1) dx$$

$$+ \int_1^2 (x-1 - x^3 + 3x^2 - 3x + 1) dx$$

$$= \int_0^1 (x^3 - 3x^2 + 2x) dx + \int_1^2 (-x^3 + 3x^2 - 2x) dx$$

$$= \left. \frac{x^4}{4} - x^3 + x^2 \right|_0^1 + \left. -\frac{x^4}{4} + x^3 - x^2 \right|_1^2$$

$$\left(\frac{1}{4} - 1 + 1 \right) - 0 + (4 + 8 - 4) - \left(-\frac{1}{4} + 1 - 1 \right)$$

$$\boxed{\frac{1}{2} \text{ units}^2}$$