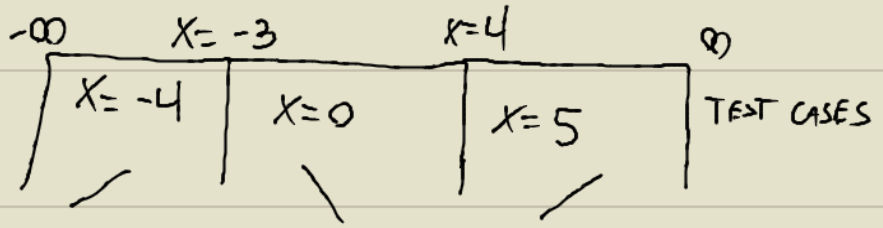
2. $f(x) = 2x^3 - 3x^2 - 72x + 2$

(3)



① $f'(x) = 2 \cdot 3x^2 - 3 \cdot 2x^1 - 72$

$= \boxed{6x^2 - 6x - 72}$

② $6x^2 - 6x - 72 = 0$

(GCF) $6(x^2 - x - 12) = 0$

(PSD) $6(x-4)(x+3) = 0$

$x - 4 = 0 \quad x + 3 = 0$

$x = 4 \quad x = -3$

INC $(-\infty, -3)$
DEC $(-3, 4)$
INC $(4, \infty)$

3. $f(x) = x + \frac{3}{x-1}$

$= x + \frac{3}{(x-1)^1}$

$= x + 3(x-1)^{-1}$

$f'(x) = 1 + 3(-1)(x-1)^{-1-1} \cdot \frac{d}{dx}(x-1)$

$= 1 - 3(x-1)^{-2}$

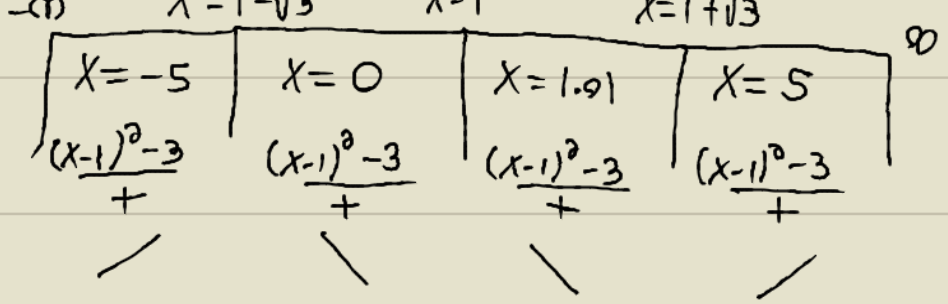
$= 1 - \frac{3}{(x-1)^2}$

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

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

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

(3)



② $(x-1)^2 - 3 = 0$

$(x-1)^2 = 3$

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

$x = 1 \pm \sqrt{3}$

$(x-1)^2 = 0$

$x - 1 = 0$

$x = 1$

INC $(-\infty, 1-\sqrt{3})$
DEC $(1-\sqrt{3}, 1)$
DEC $(1, 1+\sqrt{3})$
INC $(1+\sqrt{3}, \infty)$