

$$x f(x) \geq 0 \rightarrow \begin{array}{c} -6 \\ -6 \\ 0 \\ 0 \\ 2 \\ 2 \\ 6 \\ 6 \end{array} \rightarrow \begin{array}{c} -6 \\ -6 \\ 0 \\ 0 \\ 2 \\ 2 \\ 6 \\ 6 \end{array} \Rightarrow D_f = [-6, 0] \cup [2, 6]$$

$$\frac{-x^3}{f(x)} \geq 0 \rightarrow \begin{array}{c} -3 \\ -3 \\ 0 \\ 0 \\ 2 \\ 2 \\ 6 \\ 6 \end{array} \Rightarrow D_f = (-3, 0) \cup (0, 2) = (-3, 2) - \{0\}$$

$$x=2 \rightarrow f(2) - 2f(2) = (2)^2 - 2(2) + 4 = 2 \rightarrow f(2) = (-2) \Rightarrow f(x) + 4 = x^2 - 2x + 4 \Rightarrow f(x) = x^2 - 2x$$

$$\rightarrow x=(-2) \rightarrow f(-2) = (-2)^2 - 2(-2) = 8$$

$$f(0) = 0 - \sqrt{0+4} \sqrt{9} = -6 \rightarrow f(2) = (2)^2 + 3 = 7, f(1) = (1)^2 + 3 = 4 \rightarrow f(0) = -6 \Rightarrow 7 + 2 = 9$$

$$a(x-1)^2 - b(x-1) + 2 - (ax^2 - bx + 2) = ax^2 + a - 2xa - bx + b + 2 - ax^2 + bx - 2 = a + b - 2ax = 4x + 2 \Rightarrow -2ax = 4x \Rightarrow a = -2 \Rightarrow a + b = b - 2 = 2 \Rightarrow b = 4 \Rightarrow a - b = -2 - 4 = -6$$

$$\frac{x^2 + 4x + 6}{x^2 + 4x + 5} = \frac{x^2 + 4x + 5 + 1}{x^2 + 4x + 5} = \frac{(x+2)^2 + 1}{(x+2)^2 + 5} = \frac{(\sqrt{5})^2 + 1}{(\sqrt{5})^2 + 5} = \frac{6}{10} = \frac{3}{5}$$

$$f(x - \frac{1}{x}) = \frac{x^2 + 1}{x^2} = \frac{x^2}{x^2} + \frac{1}{x^2} = 1 + \frac{1}{x^2} = (x - \frac{1}{x})^2 + 2 \rightarrow (-3)^2 + 2 = 11 \Rightarrow f(-3)$$

$$\text{الف) } \frac{f}{g} \rightarrow D_f \cap D_g = \{x \mid g(x) \neq 0\} \rightarrow \left\{ \left(2, \frac{2}{\sqrt{5}}\right), \left(0, \frac{0}{3}\right) \right\} = \left\{ \left(2, \frac{2\sqrt{5}}{5}\right), (0,0) \right\}$$

$$\text{ب) } \frac{g}{f} \rightarrow D_f \cap D_g = \{x \mid f(x) \neq 0\} = \left\{ \left(2, \frac{3}{4}\right), \left(0, \frac{\sqrt{5}}{0}\right) \right\} \Rightarrow \left\{ \left(2, \frac{3}{4}\right) \right\}$$

$$\text{الف) } 2f(x) = \left\{ (2, 2), (3, 1), (-5, 4), (1, -4) \right\}$$

\* درجه دوم ← ضریب ۲

$$\text{ب) } f(x+1) = \left\{ (2, 2), (3, 5), (-5, 3), (1, -1) \right\}$$

\* درجه دوم ← به علاوه ۱

$$\text{ج) } 3f^2(x) + 1 = \left\{ (2, 4), (3, 49), (-5, 13), (1, 3) \right\}$$

\* درجه دوم ← به توان ۲ ← ضریب ۳ ← به علاوه ۱

$$\text{د) } f(2x) = \left\{ (1, 1), \left(\frac{3}{2}, 4\right), \left(\frac{-5}{2}, 2\right), \left(\frac{1}{2}, -2\right) \right\}$$

\* به ضریب باید به جای درجه اول که  
ضریب ۲ ← درجه اول \*

$$\text{الف) } f-g = \left\{ \left(1, \frac{4}{3}\right), (2, 2), (3, 2) \right\}$$

$\frac{4-0}{3-0} = \frac{4}{3}$      $\frac{2-1}{3-1} = \frac{1}{2}$      $\frac{2-(-1)}{3-(-1)} = \frac{3}{4}$

۱. \* درجه اول ها = مشترک هاستون

\* ~ دوم ها = درجه دوم - درجه دوم f

$$\text{ب) } \frac{2f}{g} = \left\{ \left(\frac{2 \times 4}{1}, \frac{2 \times 1}{1}\right), \left(\frac{2 \times 3}{2}, \frac{2 \times 4}{2}\right), \left(\frac{2 \times 1}{3}, \frac{2 \times 2}{3}\right) \right\} \Rightarrow \left\{ (2, 4), (3, -2) \right\}$$

~~$\frac{2 \times 4}{1} = 8$      $\frac{2 \times 1}{1} = 2$      $\frac{2 \times 3}{3} = 2$      $\frac{2 \times 4}{3} = \frac{8}{3}$~~

\* درجه اول ها = مشترک هاستون

\* ~ دوم ها =  $\frac{2 \times f \text{ درجه دوم}}{\text{درجه دوم } g}$