

$$y = \sqrt{x f(x)} \Rightarrow x f(x) \geq 0 \Rightarrow \begin{cases} \text{if } x \geq 0 \Rightarrow f(x) \geq 0 \Rightarrow \eta_f = [0, \infty) \\ \text{if } x \leq 0 \Rightarrow f(x) \leq 0 \Rightarrow \eta_f = [-\infty, 0] \end{cases}$$

$$\underline{U} \Rightarrow \eta_f = [-\infty, 0] \cup [0, \infty)$$

$$y = \sqrt{\frac{-x}{f(x)}} \Rightarrow \frac{-x}{f(x)} \geq 0, f(x) \neq 0$$

$$\Rightarrow \left\{ \begin{array}{l} \text{if } x \leq 0 \Rightarrow f(x) > 0 \Rightarrow D_f = (-\infty, 0) \\ \text{if } x > 0 \Rightarrow f(x) < 0 \Rightarrow D_f = (0, \infty) \end{array} \right\} \cup D_f[-\infty, 0) \cup (0, \infty)$$

الاعداد صحيحة $\Rightarrow$ اعداد صحيحة $= \{-2, -1, 0\} \Rightarrow$ 3

$$f(x) - rf(r) = x^r - rx + r, \quad f(-r) = ?$$

$$x=2 \rightarrow f(x) - 2f(x) = 5 - 9 + 5 = 1 \rightarrow -f(x) = 1 \Rightarrow f(x) = -1$$

$$\underline{x = -r} \Rightarrow f(-r) + f = f + f = 10 \Rightarrow \underline{f(-r) = 10}$$

$$f(f(5)) + f(f(1)) = 7$$

$$x=1 \rightarrow f(1)=4, \quad x=5 \rightarrow f(5)=4-\sqrt{9}=1$$

$$x=r \Rightarrow f(r)=v \Rightarrow \boxed{f(r)+f(s)=v+r=9}$$

$$f(x-1) - f(x) = 7x + 2$$

$$\Rightarrow \cancel{an^2} + a - \cancel{ran} - \cancel{bn} - \cancel{b} - \cancel{an^2} + \cancel{bn} - \cancel{r} = 4a + r$$

$$\Rightarrow a - r a n - b = r n + r \Rightarrow r = -r a \Rightarrow a = -r$$

$$2 \quad a - b = r \Rightarrow -r - b = r \Rightarrow b = -r \Rightarrow \boxed{-r - (-r) = -1}$$

$$\frac{2f(x) + f(-1)}{f'(x)} = ? \Rightarrow f(x) = 9 - 9 + 1 = 1, f(-1) = 1 + 1 + 1 = 3$$

$$, f(x) = 9 - 9 + 1 = 1$$

$$\Rightarrow \frac{2(1) + 3}{(-1)^2} = \frac{5}{1} = \boxed{5} \quad \textcircled{P} \checkmark$$

$$\frac{3f(x) - 2f(-x)}{f(x)} = ? \Rightarrow f(x) = 1^4 + 1 = 2, f(-x) = (-x)^4 = x^4$$

$$, f(x) = 9 + 1 = 10$$

$$\Rightarrow \frac{3(10) - 2(1)}{10} = \frac{30 - 2}{10} = \boxed{\frac{28}{10}} \quad \textcircled{P} \checkmark$$

$$\frac{f(f(x)) - f(f(x))}{f(1) - x} = \frac{f(1) - f(x)}{f(1) - x} = \frac{4 - 4}{4 - 2} = \boxed{0}$$

$\textcircled{P} \checkmark$

$$f(f(\sqrt{x-1})) = ? \Rightarrow f(\sqrt{x-1}) = \frac{x + f - f\sqrt{x-1} + f\sqrt{x-1} - 1 + 9}{x + f - f\sqrt{x-1} + f\sqrt{x-1} - 1 + 9} = \frac{1}{f} = 2$$

$$\Rightarrow f(x) = \frac{x + 1 + 9}{x + 1 + 9} = \boxed{\frac{11}{19}} \quad \textcircled{P} \checkmark$$

$$(f(\sqrt{x}))^2 - f(x) = ? \Rightarrow f(\sqrt{x}) = x + \frac{1}{x}$$

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 - f(x) = x^2 + \frac{1}{x^2} + 2 - \left(x^2 + \frac{1}{x^2}\right) = \boxed{2}$$

$\textcircled{P} \checkmark$