

$x f(x) \geq 0$ (شماره) $\rightarrow 0, 2, 5, 5$ بازرسی شکل
 $\downarrow$ $\downarrow$
 0 -5
 5 5

$\textcircled{1}$ $\textcircled{2} \rightarrow \mathcal{D}f = [-5, 0] \cup [2, 5]$

$\textcircled{1}$ (اینگر) شکل $[-5, 5]$

$\textcircled{2} \checkmark$

$\frac{x}{f(x)} \geq 0$ $f(x) \neq 0$ (شماره) $\rightarrow 5, 2, 0, -3, 0$ بازرسی شکل
 $\downarrow$ $\downarrow$
 5 2 0 -3

$\textcircled{1} \cap \textcircled{2} \rightarrow (-3, 0) \cup (0, 2) \rightarrow$ شامل عدد صحیح -2 و -1

$\textcircled{1}$ (اینگر) شکل $[-3, 5]$

۱, ۷, ۸

$f(x) - 2f(2) = x^2 - 3x + 4 \xrightarrow{x=2} f(2) - 2f(2) = (2)^2 - 3(2) + 4$
 $-f(2) = 2 \rightarrow \underline{f(2) = -2}$

$x = -2 \rightarrow f(-2) - 2f(2) = (-2)^2 - 3(-2) + 4$
 $f(-2) - 2(-2) = 14$
 $\underline{f(-2) = 10}$

$\textcircled{2} \checkmark$

$f(f(5)) + f(f(1))$

$f(1) \xrightarrow{1 < 3} 2(1) + 3 = 5$ $f(f(1)) = 2$
 $f(5) \xrightarrow{x > 3} 5 - \sqrt{5+4} = 2$
 $f(5) \xrightarrow{x > 3} 5 - \sqrt{5+4} = 2$ $f(f(5)) = 7$
 $f(2) \xrightarrow{2 < 3} 2(2) + 3 = 7$

$2 + 7 = 9$

$\textcircled{2} \checkmark$

$f(x) = ax^2 - bx + 2$ $f(x-1) \rightarrow a(x-1)^2 - b(x-1) + 2 = ax^2 - 2ax + a - bx + b + 2$
 $f(x-1) - f(x) = ax^2 - 2ax + a - bx + b + 2 - (ax^2 - bx + 2) = -2ax + a + b$
 $-2ax + a + b = 4x + 2$
 $-2ax = 4x$ $a = -2$
 $a + b = 2$ $-2 + b = 2 \rightarrow \underline{b = 4}$ $a - b = -2 - 4 = -6$

$\textcircled{2} \checkmark$

$\frac{y f(y) + f(-1)}{f'(y)}$ Ⓟ ✓	$\begin{cases} f(y) = (y)^y - y(y) + 1 = 1 \xrightarrow{y f(y)} 1 \times y = \textcircled{y} \\ f(-1) = (-1)^y - y(-1) + 1 = \textcircled{A} \\ f(y) = (y)^y - y(y) + 1 = 1 \xrightarrow{\text{derivative}} \textcircled{1} \end{cases}$ $\frac{y+A}{1} = \underline{\underline{y}}$	6
$\frac{y f(x) - y f(-y)}{f(y)}$ Ⓟ ✓	$\begin{aligned} f(x) &\xrightarrow{x=y} y(x) + 1 = 1y \xrightarrow{y f(x)} 1y \times y = \textcircled{y^2} \\ f(-y) &\xrightarrow{-y \times y} (-y)^y = x \xrightarrow{y f(-y)} y \times x = \textcircled{A} \\ f(y) &\xrightarrow{y=y} y(y) + 1 = \textcircled{y} \end{aligned}$ $\frac{y^2 - A}{y} = \underline{\underline{\frac{y^2}{y}}}$	y
$\frac{f(f(x)) - f(f(y))}{f(1) - y}$ Ⓟ ✓	$\begin{aligned} f(x) &= 1 \rightarrow f(1) = \textcircled{y} \\ f(y) &= y \rightarrow f(y) = \textcircled{y} \\ f(1) &= \textcircled{y} \end{aligned}$ $\frac{\cancel{y} - \cancel{y}}{y - y} = \underline{\underline{0}}$	A
$f(f(\sqrt{x-y}))$	$\begin{aligned} \frac{f(f(\sqrt{x-y}))}{x} &\rightarrow x = \sqrt{x-y} \rightarrow x+y = \sqrt{x} \\ x^y + x+y &= (\sqrt{x})^y + 1 \rightarrow x^y + x+y = y+1 = \textcircled{x} \\ x^y + x+y &= (\sqrt{x})^y + 1 \rightarrow x^y + x+y = y+1 = \textcircled{A} \end{aligned}$	9
$f(\sqrt{x}) = (\sqrt{x})^y + \frac{1}{(\sqrt{x})^y} = x + \frac{1}{x} \rightarrow (x + \frac{1}{x})^y = x^y + y + \frac{1}{x^y}$ Ⓟ ✓	$(x^y + y + \frac{1}{x^y}) - (x^y + \frac{1}{x^y}) = \underline{\underline{y}}$	1.