

نام و نام خانوادگی کلاس پاسخنامه تشریحی تکلیف شماره ۷ پ. آرنش

$$\sqrt{x f(x)} \geq 0 \rightarrow \begin{cases} x \geq 0 \Rightarrow [0, 6] \\ x < 0 \Rightarrow [-6, 0] \end{cases} \Rightarrow D_f = [-6, 0] \cup [0, 6]$$

(۲) ✓

$$\sqrt{\frac{-x}{f(x)}} \geq 0 \rightarrow \begin{cases} x \leq 0 \\ f(x) < 0 \end{cases} \Rightarrow (-\infty, 0) \cup (0, 2) \Rightarrow D_f = \{-2, -1, 1\}$$

(۲) ✓

$$f(x) - 2f(2) = x^2 - 3x + 4$$

$$f(2) - 2f(2) = 4 - 6 + 4$$

$$f(2) = -2$$

$$f(-2) - 2f(2) = (-2)^2 - 3(-2) + 4 \Rightarrow f(-2) + 4 = 14 \Rightarrow f(-2) = 10$$

(۲) ✓

$$f(x) = \begin{cases} x - \sqrt{x+4} & x > 3 \\ 2x+3 & x \leq 3 \end{cases}$$

$$f(f(6)) + f(f(1))$$

$$f(6-3) + f(6) \Rightarrow 7+2=9$$

(۲) ✓

$$f(x) = ax^2 - bx + 2$$

$$f(-1) - f(0) = 4(0) + 2$$

$$f(x-1) - f(x) = 4x+2$$

$$a+b+2-2=2$$

$$f(0) - f(1) = 4(1)+2$$

$$a+b=2$$

$$2-a+b-2=1$$

$$-a+b=1$$

$$a-b=-1$$

(۲) ✓

$$\begin{aligned} 2b &= 1 \Rightarrow b = \frac{1}{2} \\ a &= -\frac{1}{2} \end{aligned}$$

$$f(x) = x^r - r x + 1$$

$$\frac{r f(r) + f(-1)}{f'(r)} = \frac{r(r^r - r(r) + 1) + (-1)^r + r + 1}{(r^r - r^r + 1)^r} = \textcircled{V}$$

Ⓟ ✓

$$f(x) = \begin{cases} r x + 1 & x \geq r \\ x^r & x < r \end{cases}$$

$$\frac{r f(r) - r f(-r)}{f(r)} = \frac{r(r(r) + 1) - r((-r)^r)}{r(r) + 1} = \textcircled{\frac{r}{V}}$$

Ⓟ ✓

$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{f(r) - f(r)}{r - r} = \frac{r - r}{r} = \textcircled{0}$$

Ⓟ ✓

$$f(x) = \frac{x^r + r x + 9}{x^r + r x + 6}$$

$$\frac{x^r + r x + 9}{x^r + r x + 6} = \frac{x^r + r x + r + 6}{x^r + r x + r + 1} \Rightarrow \frac{(x+r)^r + 6}{(x+r)^r + 1} = \frac{(\sqrt{r})^r + 6}{(\sqrt{r})^r + 1} = \frac{1}{r} = r$$

$$\xrightarrow{x=r} \frac{(r)^r + r(r) + 9}{(r)^r + r(r) + 6} = \textcircled{\frac{r}{V}}$$

Ⓟ ✓

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

$$(f(\sqrt{x}))^r - f(x) = \left(x + \frac{1}{x}\right)^r - x^r - \frac{1}{x^r}$$

$$\left(\left(\sqrt{x + \frac{1}{x}}\right)^r - r\right)^r - \left(x + \frac{1}{x}\right)^r - r = x^r + \frac{1}{x^r} + r - x^r - \frac{1}{x^r}$$

Ⓟ ✓

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