

برای رسم نمودار
تابع نمایشی را به صورت یک خطی بنویسید
از نقطه آینه منتهی کنید.

۱- $nf(n) \geq 0$
 $\swarrow$
 $-5, 2, 5$

$\frac{n}{x} \mid \begin{array}{cccc} -4 & -5 & 0 & 2 & 5 \\ | & -4 & + & -4 & + & 5 \\ & x & & & & \end{array}$

$D_f = [-5, 2] \cup [2, 5]$

(۲) ✓

۲- $\frac{-n^2}{f(n)} \geq 0$
 $\swarrow$
 $-3, 0, 2, 5$

$\frac{n}{x} \mid \begin{array}{cccc} -4 & -5 & 0 & 2 & 5 \\ | & -4 & + & -4 & + & 5 \\ & x & & & & \end{array}$

$D_f = [-3, 0] \cup (0, 2]$

$\frac{n}{f(n)} < 0$ ۱, ۵ ✓

۳- $f(n) - 2f(2) = n^2 - 3n + 5$ $f(-2) = ?$

$f(2) - 2f(2) = 4 - 4 + 5$
 $-f(2) = 5$
 $f(2) = -5$

$f(n) + 5 = n^2 - 3n + 5$
 $f(-2) + 5 = 4 + 4 + 5 \Rightarrow f(-2) = 10$

۴- $f(f(5)) + f(f(1)) = ?$

$f(5) = 5 - \sqrt{5} = 2$
 $f(1) = 1 + 3 = 4$

$\Rightarrow f(2) + f(4) = 2 + 3 + 2 = 7$ (۲) ✓

۵- $f(n) = an^2 - bn + 2 \rightarrow f(n-1) - f(n) = 4n + 2$

$\xrightarrow{n=0} a + b - 2 = 0$
 $a + b = 2$

$n=1 \Rightarrow a - 2a + b = 1 \Rightarrow -a + b = 1$
 $\begin{cases} a + b = 2 \\ b - a = 1 \end{cases}$
 $2b = 3 \Rightarrow b = \frac{3}{2}, a = -\frac{1}{2} \Rightarrow a - b = -\frac{3}{2} - \frac{3}{2} = -3$ (۲) ✓

۶- $f(n) = n^2 - 3n + 1$

$\frac{2f(2) + f(-1)}{f'(2)} = \frac{2(4 - 6 + 1) + (1 - 3 + 1)}{(2 - 3)} = \frac{-2 + (-1)}{-1} = 3$ (۲) ✓

$$V- \frac{3f(4) - 2f(-2)}{f(2)} = \frac{49 - 1}{V} = \boxed{\frac{48}{V}}$$

$$f(4) = 14 + 1 = 15$$

(2) ✓

$$f(-2) = 4$$

$$f(2) = V$$

$$A- \frac{f(f(4)) - f(f(2))}{f(1) - 2} = \frac{2}{4} = \boxed{0} \quad (2) \checkmark$$

$$9- f(f(\sqrt{3}-2)) = ? \quad f(n) = \frac{n^2 + 5n + 4}{n^2 + 4n + 5}$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2)^2 + 5(\sqrt{3}-2) + 4}{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 5} = \frac{1}{4} = (2)$$

(1)

$$10- (f(\sqrt{n}))^2 - f(n) = ? \quad f(n) = n^2 + \frac{1}{n^2}$$

$$f(\sqrt{n}) = n + \frac{1}{n}$$

$$n^2 + \frac{1}{n^2} + 2 - n^2 - \frac{1}{n^2} = (2) \quad (2) \checkmark$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2+2)^2 + 5}{(\sqrt{3}-2+2)^2 + 1} = \frac{3+5}{3+1} = 2$$

$$f(f(\sqrt{3}-2)) = f(2) = \frac{(2+2)^2 + 5}{(2+2)^2 + 1} = \frac{21}{17}$$