

الف) $f(n) = \sqrt{\frac{n-1}{n} - \frac{n}{n-1}} \Rightarrow \frac{n-1}{n} - \frac{n}{n-1} \geq 0 \Rightarrow \frac{n^2 - 2n + 1 - n^2}{n(n-1)} \geq 0$ (1)

ب) $f(n) = \frac{\frac{1}{n+1} - \frac{1}{n}}{\frac{1}{n-1} + \frac{1}{n+2}} \Rightarrow n \neq 0, -1, 1, -2$ (2)

الف) $f(n) = \sqrt{\left(\left(\frac{1}{n}\right)^2 - 9\right)(17n - 17^2)}$ (3)

ب) $\sqrt{x-1} + \sqrt{y+1} = 3$ (4)

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

$f(n) = \sqrt{a + an - n^2}$ (6)

$f(n) = \begin{cases} 2n-2 & n \geq 1 \\ 2n+2 & n < 1 \end{cases}$ (7)

$f(n) = 2n^2 - 2n$ (8)

$f(n) = \frac{n+1}{n-1}$ (9)

$f(n) = n^2 - 2n$, $g(n) = \sqrt{n^2 - 1}$ (10)

$$f(n+r) = n^r - a n + q$$

$$n = -q$$

$$f(-q) = -q \times -1 = q$$

$$f(n+r) = (n-q)(n-q)$$

$$f(q) = -q \times -1 = q$$

$$n = q$$

$$\left. \begin{array}{l} f(-q) = f(q) = q \end{array} \right\} f(-q) = f(q) = \boxed{q}$$

9

$$\{ \cos^r n + a \cos n = r/w \Rightarrow \cos^r n + a(\cos n - 1) = 0 \Rightarrow (\cos n + 1)(\cos n - r) = 0 \Rightarrow \cos n = -\frac{r}{2}, \frac{r}{2} = \frac{1}{r} \}$$

10

$$f(r/w) = \tan^r n = \frac{1}{\cos^r n} - 1 = \boxed{r}$$