

الف) $\frac{n-1}{n} - \frac{n}{n-1} \geq \dots$ $\frac{(n-1)(n-1) - n^2}{n(n-1)} \geq \dots$ $(n-1)^2 - n^2 = \dots$
 $\frac{0}{+} \frac{1}{-} \frac{1}{+} \frac{1}{-}$
 ب) $n+1 \neq \dots \rightarrow n \neq -1$ $n \neq -1$
 $-1+n \neq 0 \rightarrow n \neq 1$ $\frac{n+1}{n-1} \neq 0$ $n \neq -1$
 $\frac{1}{n+1} - \frac{1}{n} = \frac{n - (n+1)}{n(n+1)} = \frac{-1}{n(n+1)}$ $\frac{1}{n(n+1)} = 0 \rightarrow n=0$ $n \neq -1$
 $\frac{1}{n+1} - \frac{1}{n} = \frac{n - (n+1)}{n(n+1)} = \frac{-1}{n(n+1)}$ $\frac{1}{n(n+1)} = 0 \rightarrow n=0$ $n \neq -1$
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الف) $(\frac{1}{n})^n - 9 \geq \dots$ $\frac{1}{n^n} - 9 \geq \dots$ $\frac{1}{n^n} - 9 = 0 \rightarrow \frac{1}{n^n} = 9 \rightarrow n = -2$
 ب) $n-1 \geq \dots \rightarrow n \geq 1$ $\frac{1}{n} - 1 \geq \dots$ $\frac{1}{n} - 1 = 0 \rightarrow \frac{1}{n} = 1 \rightarrow n = 1$
 $\sqrt{y+1} = \sqrt[3]{n-1} \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0$
 $\sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0 \rightarrow \sqrt[3]{n-1} \geq 0$

2

$\frac{1}{n} - \frac{1}{n-1} \geq \dots$ $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$
 $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$
 $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$

3

$\frac{1}{n} - \frac{1}{n-1} \geq \dots$ $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$
 $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$
 $\frac{1}{n} - \frac{1}{n-1} = 0 \rightarrow \frac{1}{n} = \frac{1}{n-1} \rightarrow n = n-1$

4

$g(n) = \sqrt{f(n) - n}$ $\sqrt{f(n) - n} \geq \dots$ $\sqrt{f(n) - n} \geq \dots$
 $\sqrt{f(n) - n} \geq \dots$ $\sqrt{f(n) - n} \geq \dots$ $\sqrt{f(n) - n} \geq \dots$
 $\sqrt{f(n) - n} \geq \dots$ $\sqrt{f(n) - n} \geq \dots$ $\sqrt{f(n) - n} \geq \dots$

5

$\left(\sin \frac{\sqrt{r}}{r} + \cos \frac{\sqrt{r}}{r}\right) = \frac{\sqrt{r+1}}{r}$
 $f\left(\frac{\sqrt{r+1}}{r}\right) = r\left(\frac{\sqrt{r+1}}{r}\right)^2 - r\left(\frac{\sqrt{r+1}}{r}\right)$
 $\frac{r \cdot \frac{r+1}{r} - r \cdot \frac{\sqrt{r+1}}{r}}{r} = -\frac{1}{r}$

$f(a) = \frac{a+1}{a-1}$
 $f\left(\frac{a+1}{a-1}\right) = a$
 $IR = \{1\}$
 $\frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{a+1+a-1}{a+1-a+1} = \frac{2a}{2} = a$

$g(a) = \sqrt{a^2 - 1}$
 $f(\sqrt{a^2 - 1}) = (\sqrt{a^2 - 1})^2 - r(\sqrt{a^2 - 1}) = a^2 - 1 - r\sqrt{a^2 - 1} = -r$
 $a^2 - 1 - r\sqrt{a^2 - 1} + r = 0$
 $(\sqrt{a^2 - 1} - r)^2 = 0$
 $a^2 - 1 = r \rightarrow a^2 = r + 1 \rightarrow a = \pm \sqrt{r+1}$

$f(n+r) = n^2 - \omega n + r$
 $f(-r) = (-r)^2 - \omega(-r) + r = r^2 + \omega r + r$
 $n+r = -r \rightarrow n = -2r$
 $n+r = r \rightarrow n = 0$
 $n = +1$
 $f(r) = 1 - \omega + r = r$

$r \cos^2 m + \omega \cos m = \frac{r\omega}{r} = \frac{\omega}{1} \rightarrow r \cos^2 m + \omega \cos m - \frac{\omega}{r} = 0$
 $\sin = \frac{\sqrt{r}}{r}$
 $\cos = \frac{1}{r}$
 $\tan^2 \theta = \frac{\sqrt{r}}{r} \times \frac{r}{1} = \sqrt{r}$
 $\cos m = \frac{1}{r} \rightarrow \theta$