

ans

①

$$f(x) = 1 - \frac{a}{x} \quad [1, 10]$$

$$1 \rightarrow 1 - a$$

$$10 \rightarrow 1 - \frac{a}{10}$$

$$\frac{1 - \frac{a}{10} - 1 + a}{10} = \frac{a}{10}$$

$$f'(x) = \frac{a}{x^2} \rightarrow \frac{a}{x^2} = \frac{a}{10} \rightarrow x^2 = 10 \rightarrow x = \pm \sqrt{10}$$

②  $y = \tan^2 x - \cos x + 10a \rightarrow$   $\tan^2 x - \cos x + 10a = 0 \rightarrow x = y$

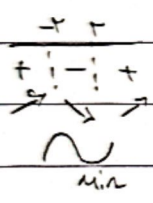
$$y' = \tan^2 x$$

$$\tan^2 x - \cos x + 10a = 0$$

$$\Delta = 0 \rightarrow 10a - \cos(10a) = 0 \rightarrow a = \frac{1}{10} \rightarrow a = \frac{1}{10}$$

③  $g = x^2 - 12x + 7$

$$g' = 2x - 12 \rightarrow x = 6 \rightarrow x = \pm 6$$



$$g(6) = (6)^2 - 12(6) + 7 = -49$$

④  $y = x^2 + ax^2 - 2bx - f$

$$a = -f$$

$$g = x^2 + 2x^2 - f$$

$$y' = 2x^2 + 2ax - 2b$$

$$(-2, 0) (0, -f)$$

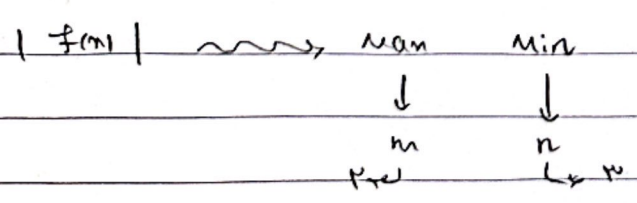
$$0 = -2b \rightarrow b = 0$$

$$\text{No. of roots: } \sqrt{f, 14} = \sqrt{14}$$

$$-f = 2x^2 - 2fx \rightarrow a = -f$$

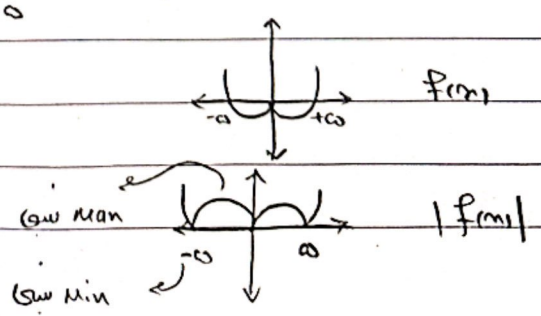
⑤  $f(x) = x^2 - \cos(x)$

$$f'(x) = \begin{cases} x^2 - \sin x = x(x - \sin x) & x > 0 \\ x^2 + \sin x = x(x + \sin x) & x < 0 \end{cases}$$



$$\frac{n}{m} = \frac{10}{1}$$

s.a.m



④  $f(x) = \begin{cases} \lambda^x + \mu^x = h(x+\mu) & x > 0 \\ \lambda(x+\mu) & x < 0 \end{cases}$

$|f(x)|$ :

⑤  $[0, a]$   $\delta_i \rightarrow \sqrt{x^2 - (x+a)}$   $\rightarrow f'(x) = \frac{x(a-x)}{\sqrt{x^2 - (x+a)}} - \frac{1}{\sqrt{x^2 - (x+a)}} \rightarrow x_n = -x_n + a \rightarrow x = \frac{a}{2}$

$a^{\frac{1}{2}} \times \frac{1}{2} a = \frac{1}{2} \rightarrow a^{\frac{3}{2}} = \frac{1}{2} \rightarrow a = \sqrt[2]{\frac{1}{2}}$

⑥  $f(x) = \begin{cases} \sqrt{x^2 - n} & x > 0 \\ \sqrt{x^2 + n} & x < 0 \end{cases}$

$\frac{kx+n}{k-x} = \frac{f(1)+0}{k} = 1$

$f'(x) = \begin{cases} \frac{x}{\sqrt{x^2 - n}} & x > 0 \\ \frac{-x}{\sqrt{x^2 + n}} & x < 0 \end{cases}$

$f'(x) \rightarrow 1, -1$

$f'(x) = 0 \rightarrow \frac{-1}{x}$   $k = k$

$f'(\frac{-1}{x}) > f'(\frac{-1}{x}) < 0 \rightarrow \frac{1}{\sqrt{1-n}} > \frac{-1}{x} \rightarrow x = 1$

s.a.m