

FIRST EXAM 2019 / الفصل الثاني

Q1 :- find the domain for $f(x) = 2 \sin^{-1}(2x+3) + 4$?

$$\Rightarrow -1 \leq 2x+3 \leq 1$$

$$-4 \leq 2x \leq -2$$

$$-2 \leq x \leq -1$$

$$\Rightarrow D_{f(x)} \equiv [-2, -1]$$

Q2 :- If $f(x) = x^3 + 2x - 7$ then $f^{-1}(-7)$ equal ?

$$\Rightarrow f^{-1}(-7) = x$$

$$f(f^{-1}(-7)) = f(x)$$

$$-7 = f(x)$$

$$\Rightarrow x^3 + 2x - 7 = -7$$

$$x^3 + 2x = 0$$

$$x(x^2 + 2) = 0$$

$$\boxed{x=0} \quad \hookrightarrow x^2 + 2 = 0$$

$$x^2 \neq -2$$

No value of x

$$\underline{\underline{\text{So } f^{-1}(-7) = \underline{\underline{0}}}}$$

Q3 :- Solve $\ln(x) + \ln(x-1) = \ln(2)$?

$$\Rightarrow \ln(x(x-1)) = \ln(2)$$

"Take e" $\rightarrow e^{\ln(x(x-1))} = e^{\ln(2)}$

$$x(x-1) = 2$$

$$\Rightarrow x^2 - x = 2$$

$$x^2 - x - 2 = 0$$

$$(x-2)(x+1) = 0$$

$$\boxed{x=2}$$

$$x = -1 \notin$$

domain

اعداد : عبادة الهياهة

#Captain Calculus...

$$\frac{7\pi}{4} \rightarrow \begin{matrix} \text{بالربع} \\ \text{الرابع} \end{matrix} \Rightarrow 2\pi - \theta \Rightarrow 2\pi - \frac{7\pi}{4} = \boxed{\frac{\pi}{4}}$$

$$\Rightarrow f \circ f(1) = f(\underbrace{f(1)}_{\downarrow 4+1=5}) = f(5) = 4(5) - 5 = \boxed{15}$$

$$\Rightarrow \text{Rational} \Rightarrow D_{f(x)} \equiv D \cap D - \left\{ \begin{array}{l} \text{القطر} \\ \text{المقام} \end{array} \right\}$$

$D_{\text{الكم}} \equiv ??$

$$= \mathbb{R} \cap [-3, 3] - \{\pm 3\}$$

even root $\left[\begin{array}{l} \rightarrow \sqrt[n]{a} \rightarrow a \\ \rightarrow |a| \end{array} \right]$

$$\underline{\underline{So}} \quad D_{f(x)} = (-3, 3)$$

$$9 - x^2 = 0$$

$$q = x^2$$

$$x = \pm 3$$

⇒ $\begin{array}{c} X \quad \checkmark \quad X \\ \hline - - \quad + + \quad - - \\ \quad -3 \quad \quad 3 \end{array}$

Just Smile

Q7 :- The function $y = e^{x+1} + 3$ is obtained from the function $y = e^x$ by ??

$$\Rightarrow e^x \rightarrow e^{x+1} \rightarrow e^{x+1} + 3$$

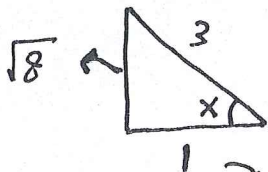
by :- Shifting 1 unit Left and 3 unit up

* الترتيب غير مهم * $\hat{=}$

Q8 :- If $\cos(x) = \frac{-1}{3}$, $\frac{\pi}{2} < x < \pi$ then $\tan(x) = ?$

$$\Rightarrow \cos(x) = \frac{-1}{3} = \frac{\text{جوار}}{\text{وتر}}$$

بالربع الثاني



"+1" لأنه ما في طول بالـ 1

$$\Rightarrow \tan(x) = \frac{\text{مقابل}}{\text{جوار}} = \frac{\sqrt{8}}{1} = \sqrt{8} = -\sqrt{8}$$

لأنه الـ \tan بالربع الثاني يكون سالبة

Q9 :- find the Inverse function $(f^{-1}(x))$ for $f(x) = \frac{e^x - 1}{e^x - 2}$?

$$\Rightarrow x = \frac{e^y - 1}{e^y - 2}$$

$$e^y(x-1) = 2x-1$$

$$xe^y - 2x = e^y - 1$$

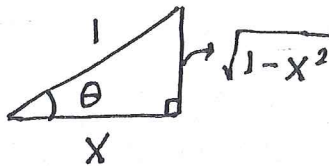
$$e^y = \frac{2x-1}{x-1}$$

$$xe^y - e^y = 2x - 1$$

$$y = \ln\left(\frac{2x-1}{x-1}\right) = f^{-1}(x)$$

Q10:- find $\sin(2\cos^{-1}(x))$?? \Rightarrow type 1 \Rightarrow « Obadah »
Al-Habbbeh

$$\cos^{-1}(x) = \theta$$

$$x = \cos(\theta) \rightarrow$$


Now $\sin(2\theta) = 2\sin(\theta)\cos(\theta)$

مطابقة ✓

$$= 2\left(\frac{\sqrt{1-x^2}}{1}\right) * \left(\frac{x}{1}\right)$$

$$= \boxed{2x\sqrt{1-x^2}}$$

Q11:- which of the following function is one to one function?

A) $\ln(x^2) \rightarrow$ not 1-1

B) $|x|, x \geq -1 \rightarrow$ not 1-1

C) $e^{x^2+1} \rightarrow$ not 1-1

✓ D) $2\ln(x) \rightarrow$ one to one ✓

Q12:- Solve $e^{5x} - 4e^{3x} = 0$??

$$e^{3x}(e^{2x} - 4) = 0$$

$$e^{3x} \neq 0$$

$$e^{2x} = 4 \rightarrow \ln e^{2x} = \ln 4 \rightarrow 2x = \ln 4$$

No Value

$$\rightarrow x = \frac{\ln 2^2}{2} = \frac{2\ln(2)}{2} = \boxed{\ln(2)}$$

GOOD Luck ...

دعواتكم