King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 132

Recitation (4.1)

Answered by S. Omar

Question 1: Decide whether each of the following function is one-to-one. Find $f^{-1}(x)$ for those functions that are one to one.

(a) : $f(x)=-\frac{3}{2}x+1$ **(b):** $f(x)=\frac{2x-1}{3x-1};\ x\neq 1/3$ **(c):** $f(x)=\sqrt{49-x^2}$

Answer:

(a):	(b):	(c):
$f^{-1}(x)=-\frac{2}{3}x+\frac{2}{3}$	$f^{-1}(x)=\frac{1-x}{2-3x}=\frac{x-1}{3x-2}$	The function $f(x)=\sqrt{49-x^2}$ is not one-to-one because $f(-7)=f(7)=0$ Therefore f has no inverse.

Question 2: **Question 2:** If $f(x)=\frac{ax+b}{cx+d}$ is the inverse function of $\frac{4x+3}{1-x}$ then $a+b+c+d=$

A) 9 B) 3 C) 5 D) 2 E) 7

Answer: (B) 3

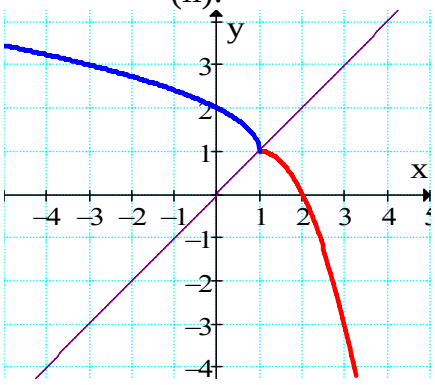
Question 3: If $f(x)=2x-x^2;\ x\geq 1$ then

i) find $f^{-1}(x)$

ii) sketch the graph of $f^{-1}(x)$

Answer: (i): $f^{-1}(x)=1+\sqrt{1-x}$

(ii):



$f(x)=2x-x^2;\ x\geq 1$

Question 4: If $f(x)=\frac{1}{x}-1$ then the domain D and the range R of the inverse function f^{-1} are

(a) $D=(-\infty,0)\cup(1,\infty)$ and $R=(-\infty,0)\cup(0,\infty)$

(b) $D=(0,1)$ and $R=(-\infty,0)\cup(0,\infty)$

(c) $D=(-\infty,-1)\cup(-1,\infty)$ and $R=(-\infty,0)\cup(0,\infty)$

(d) $D=(-\infty,0)\cup(0,1)\cup(1,\infty)$ and $R=(-1,0)\cup(0,1)$

(e) $D=(-\infty,1)\cup(1,\infty)$ and $R=(-\infty,1)\cup(1,\infty)$

Answer: (c) $D=(-\infty,-1)\cup(-1,\infty)$ and $R=(-\infty,0)\cup(0,\infty)$

Question 5: Let $f^{-1}(x)=-1+\sqrt{1-x}$, then

A) $f(x)=x^2+2x$ where $x>-1$

B) $f(x)=x^2+2x$ where $x<-1$

C) $f(x)=(x+1)^2+1$ where $x<-1$

D) $f(x)=-x^2-2x$ where $x>-1$

E) $f(x)=-x^2-2x$ where $x<-1$

Answer: (D): $f(x)=-x^2-2x$ where $x>-1$