# King Fahd University of Petroleum and Minerals

## Prep-Year Math Program

## Math 002 - Term 151

## Recitation (4.1)

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**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 $f(-7)=f(7)=0$<br><br>Therefore $f$ has no inverse. |

**Question 2:** If $f(x)=ax+12$ and $f^{-1}(-2)=3$ then find $f(2)$

**Answer:** $\frac{8}{3}$

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

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

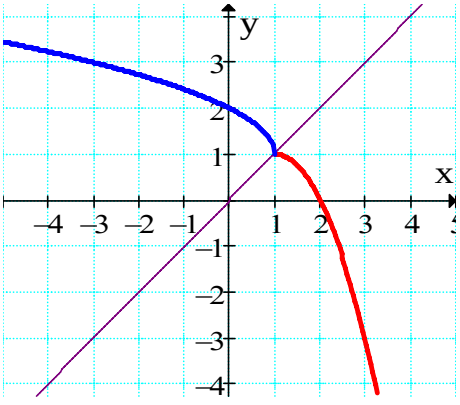
ii) sketch the graph of $f^{-1}(x)$

**Answer:**

**i):** $f^{-1}(x)=1+\sqrt{1-x}$ ; $R_{f^{-1}}=[1,\infty)$ ; $D_{f^{-1}}=(-\infty,1]$

**ii):**

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




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

**Question 4:** If $f(x)=\dfrac{2x+1}{x-1}$, $x\neq 1$, then $f^{-1}(x)$ is equal to

**Answer:** $f^{-1}(x)=\dfrac{x+1}{x-2}$, $D_{f^{-1}}=(-\infty,2)\cup(2,\infty)$ and $R_{f^{-1}}=(-\infty,1)\cup(1,\infty)$

**Question 5:** If $f(x)=\dfrac{2x}{x-1}$, $x\neq 1$, then $f^{-1}\left(\dfrac{3}{2}\right)$ is equal to

(a) $-3$
(b) $3$
(c) $2/3$
(d) $-2/3$
(e) $3/2$

**Answer:** (a): $f^{-1}\left(\dfrac{3}{2}\right)=-3$