1)Find the domain and range of y=$\frac{2x}{x-1}$

Solution//

X-1=0→x=1→domain function=R except {1}

y=$\frac{2x}{x-1}$→yx-y=2x

x=$\frac{y}{y-2}$

y-2=0→ $y = 2$

Range function=R except {2}

2) Find the domain and range of y=$\sqrt{\frac{x-1}{x+2}}$

Solution/

x-1≥ 0 → $x \geq 1$

x+2≥ 0 → $x > -2$

Domain function={x:x≥ 1}∩{x:x> −2}

y=$\sqrt{\frac{x-1}{x+2}}$

Y²=$\frac{x-1}{x+2} \rightarrow xy^2 + 2y^2 = x - 1$

$\rightarrow xy^2 - x = -1 - 2y^2$

$\rightarrow x = \frac{-1-2y^2}{y^2-1} \rightarrow y^2 - 1 = 0 \rightarrow y = \pm 1$

Range function=R except {+1. −1}

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3) Given $f(x)=(x-2)^3+1$ find $f^{-1}(x)$

Solution//

$y=(x-2)^3+1$

$x=(y-2)^3+1$

$x=(y-2)3+1$

$x-1=(y-2)^3$

$(x-1)^{1/3}=y-2$

$(x-1)^{1/3}+2=y$

$f^{-1}(x)=(x-1)^{1/3}+2$

4) Given $f(x)=5-9x$ find $f^{-1}(x)$

Solution//

$y=5-9x$

$x=5-9y$

$9y=5-x$

$y=(5-x)/9$

$f^{-1}(x)=(5-x)/9$

Example5: Evaluate the following limits if they exist.

1) $\lim_{x\to-1} \frac{\sqrt{2+x}-1}{x+1}$ $, x \neq -1, \ x \neq -2$

Sol:

$$\lim_{x\to-1} \frac{\sqrt{2+x}-1}{x+1} * \frac{\sqrt{2+x}+1}{\sqrt{2+x}+1} = \lim_{x\to-1} \frac{2+x-1}{x+1(\sqrt{2+x}+1)}$$

$$\lim_{x\to-1} \frac{x+1}{x+1(\sqrt{2+x}+1)} = \lim_{x\to-1} \frac{1}{(\sqrt{2+x}+1)} = \frac{1}{(\sqrt{2-1}+1)} = \frac{1}{2}$$