Finding Domain Algebraically

Ex 1 $f(x) = \frac{2-x}{x^2-4x-21}$

Fractions (denom.) can interfer w/ domain

$f(x) = \frac{2-x}{(x-7)(x+3)}$

ZPP $x-7 \neq 0$ $x+3 \neq 0$

$x \neq 7$ $x \neq -3$

Domain: $(-\infty,-3) \cup (-3,7) \cup (7,\infty)$

Ex 2 $y = \sqrt{8-x}$

$8-x \geq 0$

$+x \quad +x$

$8 \geq x$

$x \leq 8$

Domain: $(-\infty, 8]$

Ex 3 $f(x) = \frac{\sqrt{x+3}}{2-x}$

numerator: $x+3 \geq 0$, $-3 \quad -3$, $x \geq -3$

denominator: $2-x \neq 0$, $x \neq 2$

Domain: $[-3, 2) \cup (2,\infty)$

Ex 4 $g(x) = \frac{x^2-3x-4}{x+1}$

$= \frac{(x-4)(x+1)}{(x+1)}$

cancelled factors create a hole in the graph

$g(x) = (x-4)$

Domain: $(-\infty,-1) \cup (-1,\infty)$

Challenge:

$f(x) = \sqrt{9-x^2}$

$9-x^2 \geq 0$

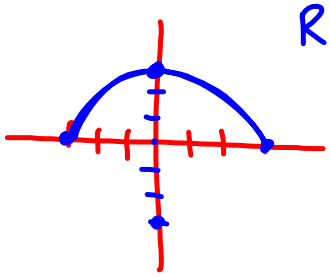
$-x^2 \geq -9$

$x^2 \leq 9$

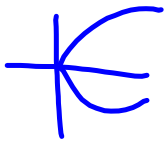
$x \leq \pm 3$

$-3 \leq x \leq 3$

Domain: $[-3, 3]$



Range: $[0, 3]$



Assignment: #77a-c, 79, 80, 83, 86a, b p104