① $f(x) = \sqrt{x+4}$

a) $f(12) = \sqrt{(12)+4}$
$= \sqrt{16}$
$= \sqrt{4 \cdot 4}$
$= 4$

b) $f(8) = \sqrt{(8)+4}$
$= \sqrt{12}$
$= \sqrt{2 \cdot 2 \cdot 3}$
$= 2\sqrt{3}$

c) $f(-3) = \sqrt{(-3)+4}$
$= \sqrt{1}$
$= 1$

② $H(x) = \sqrt[3]{\frac{x-3}{x-2}}$

a) $H(4) = \sqrt[3]{\frac{(4)-3}{(4)-2}}$
$= \sqrt[3]{\frac{1}{2}}$
$\frac{\sqrt[3]{1}}{\sqrt[3]{2}}$
$\frac{1}{\sqrt[3]{2}}$
$\frac{1}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2 \cdot 2}}{\sqrt[3]{2 \cdot 2}}$
$\frac{\sqrt[3]{4}}{2}$

b) $H(7) = \sqrt[3]{\frac{(7)-3}{(7)-2}}$
$= \sqrt[3]{\frac{4}{5}}$
$\frac{\sqrt[3]{4}}{\sqrt[3]{5}} \cdot \frac{\sqrt[3]{5 \cdot 5}}{\sqrt[3]{5 \cdot 5}}$
$\frac{\sqrt[3]{100}}{5}$

c) $H(-2) = \sqrt[3]{\frac{(-2)-3}{(-2)-2}}$
$= \sqrt[3]{\frac{-5}{-4}}$
$= \sqrt[3]{\frac{5}{4}}$
$= \frac{\sqrt[3]{5}}{\sqrt[3]{4}}$
$= \frac{\sqrt[3]{5}}{\sqrt[3]{2 \cdot 2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}}$
$\frac{\sqrt[3]{10}}{2}$

DOMAIN

1. IF INDEX IS ODD
   D: $(-\infty, \infty)$
2. IF INDEX IS EVEN
   SET WHAT IS UNDER RADICAL ≥ 0 AND SOLVE

③ $g(x) = \sqrt{5x-2}$

$5x - 2 \geq 0$
$5x \geq 2$
$\frac{5x}{5} \geq \frac{2}{5}$
$x \geq \frac{2}{5}$

$\left[\frac{2}{5}, \infty\right)$

④ $h(x) = \sqrt[5]{7x-1}$

$(-\infty, \infty)$

⑤ $f(x) = \sqrt{\frac{5}{x+2}}$

$x + 2 \geq 0$
↓ FMC
$x + 2 > 0$
$x > -2$

$(-2, \infty)$

$f(x) = \sqrt{\frac{-5}{x+2}}$

$x + 2 < 0$
$x < -2$

$\frac{-5}{-4}$