Question #2

a) $\frac{\sqrt[3]{4}}{\sqrt[3]{108}} = \frac{4^{1/3}}{108^{1/3}} = \boxed{\frac{1}{3}}$

b) $27^{\frac{2}{3}} = \boxed{\sqrt[3]{27^2}}$

c) $2x^2(3x^5)^2$

$2x^2(3^2 \times 10)$

$2x^2(9x^{10})$

$\boxed{18x^{12}}$

d) $(2x^{-2})^{-3} \quad 1x^{-3}$

$\frac{1}{\left(\frac{2}{x^2}\right)^3}\left(\frac{1}{x^3}\right)$

$\frac{x^6}{8x^3} = \frac{x^3}{8}$

$\frac{1}{\frac{8}{x^6}}\left(\frac{1}{x^3}\right) \rightarrow \frac{1}{\frac{8}{x^6}} = \frac{x^6}{8}\left(\frac{1}{x^3}\right) \rightarrow \frac{x^6}{8x^3} \rightarrow \boxed{\frac{x^3}{8}}$

e) $\frac{3a^{1/2} - a^{1/2}}{a^-} \rightarrow \frac{2a^{1/2}}{a^{-1}}$

$\rightarrow 2a^{1/2}\,a^1$

$\boxed{2a^{3/2}}$

$\frac{1}{\frac{1}{a}} = a^1$

f) $\frac{\sqrt[3]{a\sqrt{b^1}}}{\sqrt[3]{ab}} \rightarrow \sqrt{b} \rightarrow b^{1/2} \rightarrow \sqrt{a(b^{1/2})}$

$(ab^{1/2})^{1/2}$

$\sqrt[3]{(ab)} = (ab)^{1/3} \rightarrow a^{1/3}b^{1/3}$

Question #3

a) $f(x) = b^x,\ b > 0$ b) The domain of the function is $\mathbb{R}$

c) If $b \neq 1$, the range of the function is $(0, \infty)$

3d is located on the next page

Additional things — HW 01

$f(x) = 2x + 4^x$. Find $f^{-1}(6)$

$6 = 2x + 4^x \quad x = 1$

Thus, $\boxed{f^{-1}(6) = 1}$

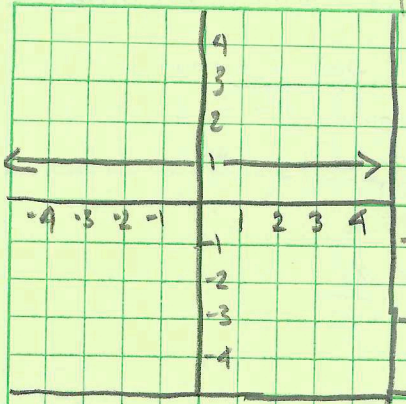
$4^1 = 4$ +

$2(1) = 2$

(6)

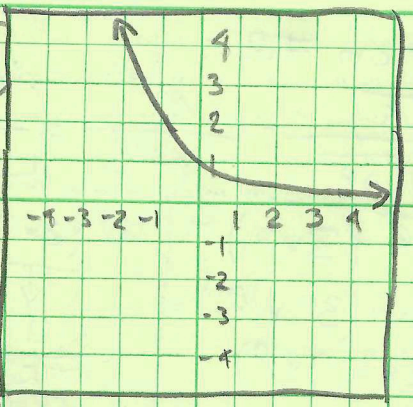
Question 3d

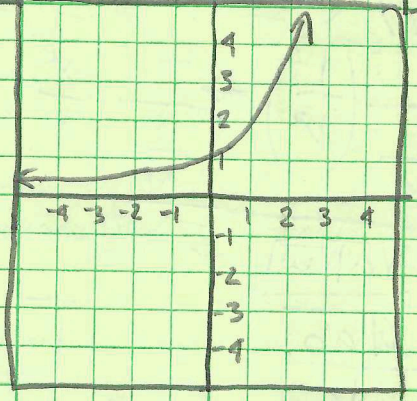
$b^x = 1^x$



$b^x = 1^x$

$b^x = (0<b<1)^x$





$b^x = (b>1)^x$