

$$e = 2.71828183\dots$$

New Functions from old:

Algebraic operations:

$$f(x) \pm g(x)$$

$$f(x) \cdot g(x)$$

$$\frac{f(x)}{g(x)}$$

Composition:

$$f(g(x))$$

Inverses:

$f^{-1}(x)$ is the value such that $f(f^{-1}(x)) = x$. Also,

$$f^{-1}(f(x)) = x.$$

Logarithms

Logarithms: ($\log_b x$ is the inverse function of b^x)

• $\log_b x$ is the exponent on b that gives x :

$$y = \log_b x \Leftrightarrow b^y = x.$$

• $\log_{10} = \log$

• $\log_e = \ln$

Properties: see p. 25

Exercises:

① $\log_2 \frac{1}{8}$

② Solve for x : $\log x = -1$

End Review ③ Solve for x : ~~2^x~~ $2^{3x+1} = 4^x$

Transformations of functions:

$f(x \pm c)$ is the translation of f c units left

$f(cx)$ is the horizontal ~~translation~~ scaling of f by $\frac{1}{c}$

$f(x) \pm c$ is the translation of f c units up

$cf(x)$ is the vertical scaling of f by c .