(1)

Power statement	Log statement
a) $4^4 : 256$	$\log_4 256 = 4$
b) $3^{-2} = \frac{1}{9}$	$\log_3 \left(\frac{1}{9}\right) = -2$
c) $10^6 = 1000000$	$\log_{10} 1000000 = 6$
d) $11^1 = 11$	$\log_{11} 11 = 1$
e) $0.2^3 = 0.008$	$\log_{0.2} 0.008 = 3$

(2)

Log statement	Power statement
a) $\log_2 16 = 4$	$2^4 = 16$
b) $\log_5 25 = 2$	$5^2 = 25$
c) $\log_9 3 = \frac{1}{2}$	$9^{1/2} = 3$
d) $\log_5 0.2 = -1$	$5^{-1} = 0.2$
e) $\log_{10} 100000 = 5$	$10^5 = 100000$

③ a) $\log_2 8 = 3$ $2^3 = 8$

b) $\log_5 25 = 2$ $5^2 = 25$

c) $\log_{10} 10000000 = 7$ $10^7 = 10000000$

d) $\log_{12} 12 = 1$ $12^1 = 12$

e) $\log_3 729 = 6$ $3^6 = 729$

f) $\log_{10} \sqrt{10} = 1/2$ $10^{1/2} = \sqrt{10}$

g) $\log_4 (0.25) = -1$ $4^{-1} = 1/4$

h) $\log_{0.25} 16 = -2$ $\frac{1}{4}^{-2} = \left(\frac{1}{16}\right)^{-1} = 16$

i) $\log_a (a^{10}) = 10$ $a^{10} = a^{10}$

j) $\log_{(2/3)} \left(\frac{9}{4}\right) = -2$ $\left(\frac{2}{3}\right)^{-2} = \left(\frac{4}{9}\right)^{-1} = \frac{9}{4}$

④ a) $\log_5 x = 4$ $\quad 5^4 = 625 = x$

$\therefore x = 625$

b) $\log_x 81 = 2$ $\quad x^2 = 81$

$\therefore x = 9$

c) $\log_7 x = 1$ $\quad 7^1 = x$

$\therefore x = 7$

d) $\log_x (2x) = 2$

$x^2 = 2x$

$x^2 - 2x = 0$

$x(x-2) = 0$

~~$x = 0$~~ not pass or $x = 2$