

Supplementary Worksheet – Exponents

- (I) For each of the letters  $a-h$ , determine if the expression is true or false, given the information for each of the numbers 1-4. So, you'll be doing  $a-h$  repeatedly, for each of the numbers 1-4.

Hint: Each time, replace the variable with the appropriate number of your choice.

- ①  $m$  is an odd positive integer
- ②  $m$  is an even positive integer
- ③  $m$  is an odd negative integer
- ④  $m$  is an even negative integer

a)  $3^m < 1$

b)  $2^{-m} < 1$

c)  $\left(-\frac{1}{4}\right)^m \geq \frac{1}{4}$

d)  $\left(\frac{1}{5}\right)^{-m} \geq 5$

e)  $(-2)^m \leq 2$

f)  $\frac{-1}{2^{-m}} < 0$

g)  $\left(-\frac{1}{3}\right)^{-m} > 1$

h)  $(-3)^{-m} > 0$

- (II) For each of the letters  $a-h$ , determine if the expression is true or false, given the information for each of the numbers 1-4. So, you'll be doing  $a-h$  repeatedly, for each of the numbers 1-4.

Hint: Each time, replace the variable with the appropriate number of your choice.

①  $0 < a < 1$

②  $a > 1$

③  $-1 < a < 0$

④  $a < -1$

a)  $\left(\frac{1}{a}\right)^3 < \frac{1}{a}$

b)  $\left(\frac{1}{a}\right)^{-3} > \frac{1}{a}$

c)  $a < a^2 < 1$

d)  $a^{-3} > 0$

e)  $\left(-\frac{1}{a}\right)^3 > 0$

f)  $(-a)^3 < 0$

g)  $(-a)^{-2} < 0$

h)  $\left(-\frac{1}{a}\right)^{-2} > 0$