

Laws of Exponents + Scientific Notation

$$\textcircled{1} \quad \frac{0.00003}{5 \times 10^4} = \frac{3 \times 10^{-5}}{5 \times 10^4}$$

$$\begin{aligned}
 3 \quad \boxed{EE} \quad -5 &= 0.6 \times 10^{-9} \\
 5 \quad \boxed{EXP} \quad 4 &= \underbrace{6 \times 10^{-1}} \times 10^{-9} \\
 \boxed{SCI} &= 6 \times 10^{-10} \quad 6 \quad -10 \\
 \boxed{\times 10^x} &
 \end{aligned}$$

$$\textcircled{2} \quad 4 \times 10^{-4} \times 0.000005$$
$$\textcircled{4} \times 10^{-4} \times \textcircled{5} \times 10^{-6}$$

$$\begin{array}{l} \underline{20} \times 10^{-10} \\ 2 \times 10^1 \times 10^{-10} \\ \hline 2 \times 10^{-9} \end{array}$$

$$\begin{aligned} \textcircled{3} \quad \frac{0.000\ 000\ 1}{4 \times 10^4} &= \frac{1 \times 10^{-7}}{4 \times 10^4} \\ &= \frac{0.25 \times 10^{-11}}{2.5 \times 10^{-1} \times 10^{-11}} \\ &= 2.5 \times 10^{-12} \end{aligned}$$

$$\textcircled{4} \quad 7 \times 10^{-9} \times \underbrace{0.000007}$$

$$\underline{7} \times 10^{-9} \times \underline{7} \times 10^{-6}$$

$$49 \times 10^{-15}$$

$$\underbrace{49} \times 10^{-15}$$

$$4.9 \times 10^1 \times 10^{-15}$$

$$4.9 \times 10^{-14}$$

- Finish rest (5-8)

and pp 8-9 Review Booklet

+ p.7 quiz pkg.

⑤

$$\frac{0.000006}{8 \times 10^6} = \frac{6 \times 10^{-5}}{8 \times 10^6}$$
$$= 0.75 \times 10^{-5-6}$$
$$= 0.75 \times 10^{-11}$$
$$= 7.5 \times 10^{-1} \times 10^{-11}$$
$$= 7.5 \times 10^{-12}$$

⑥

$$9 \times 10^{-4} \times 0.0000008$$

$$\underline{9} \times 10^{-4} \times \underline{8} \times 10^{-7}$$

$$72 \times 10^{-11}$$

$$7.2 \times 10^1 \times 10^{-11}$$

$$\boxed{7.2 \times 10^{-10}}$$

$$\begin{aligned} \textcircled{7} \quad \frac{0.000\ 000\ 2}{5 \times 10^3} &= \frac{2 \times 10^{-7}}{5 \times 10^3} \\ &= 0.4 \times 10^{-7-3} \\ &= 0.4 \times 10^{-10} \\ &\quad \underbrace{\hspace{1cm}} \\ &= 4 \times 10^{-1} \times 10^{-10} \\ &= \boxed{4 \times 10^{-11}} \end{aligned}$$

⑧

$$3 \times 10^{-7} \times 0.00005$$

$$\underline{3} \times 10^{-7} \times \underline{5} \times 10^{-5}$$

$$\underline{15} \times 10^{-12}$$

$$1.5 \times 10^1 \times 10^{-12}$$

$$\boxed{1.5 \times 10^{-11}}$$

Supplementary Worksheet - Exponents

① m is an odd positive integer

e.g. 3

a) $3^m < 1$

$$3^3 < 1$$

$$27 < 1 \quad (\text{F})$$

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

$$2^{-3} < 1$$

$$\frac{1}{2^3} < 1$$

$$\frac{1}{8} < 1 \quad (\text{T})$$

$$c) \left(-\frac{1}{4}\right)^3 \geq -\frac{1}{4}$$

$$\left(-\frac{1}{4}\right)^3 \geq -\frac{1}{4}$$

$$\frac{-1}{4^3} \geq -\frac{1}{4}$$

$$\frac{-1}{64} \geq -\frac{1}{4} \quad \text{(F)}$$

$$d) \left(\frac{1}{5}\right)^{-3} \geq 5$$

$$\left(\frac{1}{5}\right)^{-3} \geq 5$$

$$5^3 \geq 5$$

$$125 \geq 5 \quad \text{(T)}$$

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

$$(-2)^3 \leq 2$$

$$-8 \leq 2 \quad (\text{T})$$

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

$$\frac{-1}{2^{-3}} < 0$$

$$\frac{-1 \cdot 2^3}{1} < 0$$

$$-8 < 0 \quad (\text{T})$$

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

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

$$(-3)^3 > 1$$

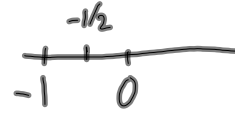
$$-27 > 1 \quad \text{Ⓕ}$$

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

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

$$\frac{1}{(-3)^3} > 0$$

$$-\frac{1}{27} > 0 \quad \text{Ⓕ}$$

(II) ① $0 < a < 1$ Let $a = \frac{1}{2}$ ② $a > 1$ $a = 2$ ③ $-1 < a < 0$ ④ $a < -1$ $a = -2$

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

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

$$2^3 < 2$$

$$8 < 2 \quad \text{ⓕ}$$

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

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

$$2^{-3} > 2$$

$$\frac{1}{2^3} > 2$$

$$\frac{1}{8} > 2 \quad \text{ⓕ}$$

$$c) \quad a < a^2 < 1$$

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

$$\frac{1}{2} < \frac{1}{4} < 1 \quad \text{(F)}$$

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

$$\left(\frac{1}{2}\right)^{-3} > 0$$

$$2^3 > 0$$

$$8 > 0 \quad \text{(T)}$$

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

$$\left(\frac{-1}{\frac{1}{2}}\right)^3 > 0$$

$$(-2)^3 > 0$$

$$-8 > 0 \quad \text{(F)}$$

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

$$\left(-\frac{1}{2}\right)^3 < 0$$

$$-\frac{1}{8} < 0 \quad \textcircled{T}$$

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

$$\left(-\frac{1}{2}\right)^{-2} < 0$$

$$(-2)^2 < 0$$

$$4 < 0 \quad \text{(F)}$$

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

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

$$(-2)^{-2} > 0$$

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

$$\frac{1}{4} > 0 \quad \text{(T)}$$

FOR TOMORROW :
have pp 1-19 Review Booklet
done

pp 1-10 Quiz Pkg
done

