8: Indices:

1. Notation:

2 multiply 3 times

$$2 \times 2 \times 2 = 2^3$$
$$a \times a \times a \times a = a^4$$

2. Rules:

1. Multiplication
   e.g. $2^2 \times 2^3 = 2^{(2+3)} = 2^5$

2. Division
   e.g. $2^3 \div 2^2 = 2^{(3-2)} = 2^1$

3. Power
   e.g. $(2^3)^2 = 2^{3 \times 2} = 2^6$

4. Power of 0
   (Everything power 0 is 1)
   e.g. $2^0 = 3^0 = 1$

5. **Power of negative number**
   (reciprocal number with negative power to form number with positive power)

   e.g. $2^{-5} = \dfrac{1}{2^5}$

6. **Power of fraction**
   (fraction in the power means root)

   e.g. 1. $2^{\frac{1}{2}} = \sqrt{2}$
   2. $2^{\frac{1}{3}} = \sqrt[3]{2}$

7. **Power combined**
   (denominator in the power is to root)
   (numerator in the power is normal power)

   e.g. $2^{\frac{2}{3}} = \sqrt[3]{2^2}$