




## Check Your Understanding – Number Sets and Exponents 1

The table below identifies the key concepts from this unit.

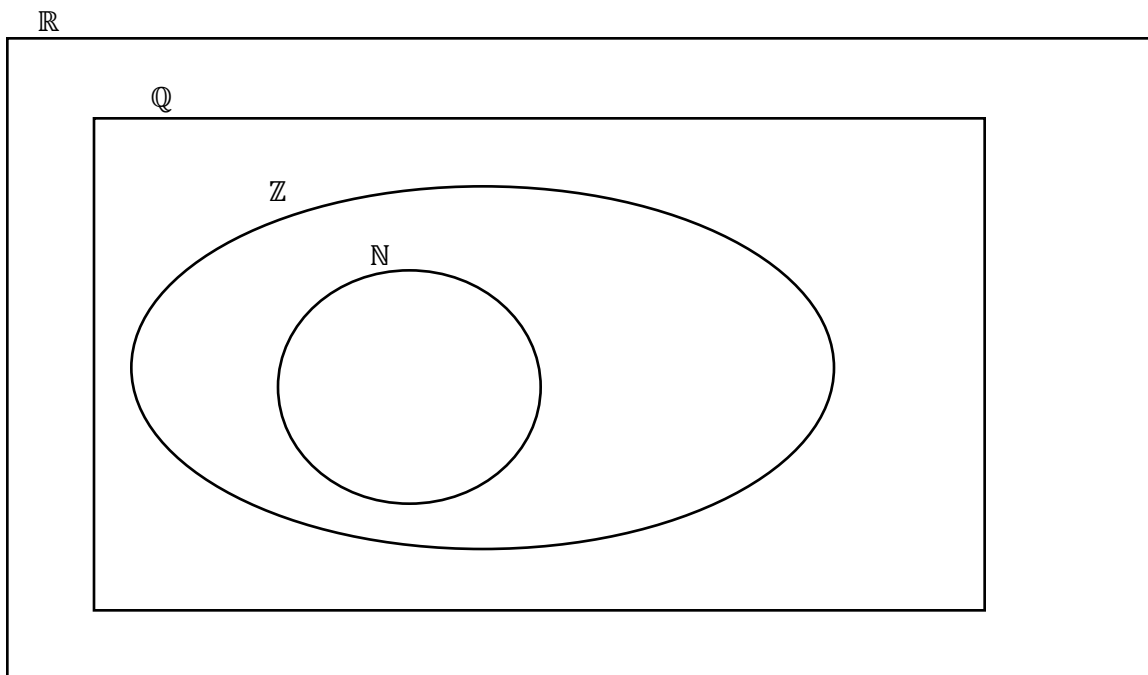
1. Check your understanding by completing these questions.
2. Check your answers in the key provided.
3. In the table below, highlight the questions you got correct.
4. Ask peers/Dr. James about concepts where you can improve.

Key Concepts	 Mild	 Medium	 Spicy
Number Sets	1	2, 3, 4	
Exponential Notation	5		
Simplifying and Expanding Basic Exponents	6, 7	8, 9	10, 11
Multiplying Exponents	12	13, 14	15
Dividing Exponents	16	17, 18	19

1) Place the following numbers in the appropriate section of the diagram below:

$6.8$     $\frac{4}{7}$     $3$     $\sqrt{15}$     $17$     $-40$     $\pi$     $7.98567 \dots$     $-\sqrt{16}$     $-\frac{20}{5}$     $5.56\overline{78}$

Also add one additional number in each section



2) Write a number that is an integer, but is **not** a natural number.

3) Write a number that is a rational number but is **not** an integer.

4) Write a number that is a real number but is **not** a rational number.

5) Write a power with a base of 8 and an exponent of 6.

6) Use exponential notation to simplify the following products:

7) Calculate the following powers

a)  $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$

a)  $5^3$

b)  $z \times z \times z \times z$

b)  $9^4$

8) Use exponential notation to simplify the following products:

9) Calculate the following powers

a)  $-2 \times -2 \times -2 \times -2$

a)  $-8^4$

b)  $-5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

b)  $(-4)^6$

10) Use exponential notation to simplify the following products:

11) Use exponential notation to simplify the following products:

a)  $3 \times b \times b \times b \times 3 \times 3 \times 3 \times 3$

a)  $12 \times 12 \times 12 + 12 \times 12 \times 12 \times 12$

b)  $4a * 4a * 4a + 3 * b * b * b$

b)  $(a + b)(a + b)(a + b)(a + b)$

12) Use exponential notation to simplify the following:

a)  $9^3 \times 9^{12}$

b)  $a^3 \cdot a^4$

14) Use exponential notation to simplify the following:

a)  $\left(\frac{2}{5}\right)^3 \times \left(\frac{2}{5}\right)$

b)  $b^m * b^p$

16) Use exponential notation to simplify the following:

a)  $4^7 \div 4^2$

b)  $\frac{6^{14}}{6^3}$

18) Use exponential notation to simplify the following:

a)  $\frac{12k^8}{4k^3}$

b)  $(5h^4t^2) \div (25th^3)$

13) Use exponential notation to simplify the following:

a)  $(-3)^2(-3)^5$

b)  $4^3 \cdot 4$

15) Use exponential notation to simplify the following:

a)  $3m^2 \cdot -2m^5$

b)  $(a^3b^2)(-a^5b)(b^3)(ab)$

17) Use exponential notation to simplify the following:

a)  $m^{25} \div m^4$

b)  $\frac{a^3b^6}{a^2b^4}$

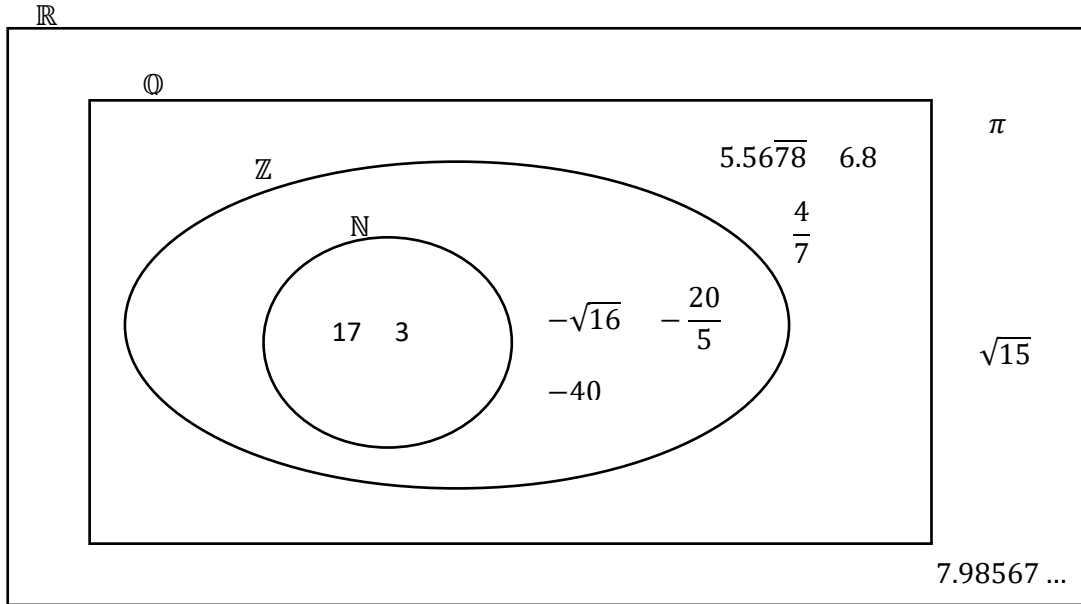
19) Use exponential notation to simplify the following:

a)  $\frac{3a^3}{b^4} \cdot \frac{b^7}{9a}$

b)  $\frac{-2a^5b^2}{3ba^2} \cdot \frac{3a^2b^4}{4ab^{10}}$

## Answers

1)



2) Many answers. Some examples are:

$$-40, -13, -1$$

3) Many answers. Some examples are:

$$6.8, \frac{3}{5}, \frac{7}{6}, 1.\bar{6}$$

4) Many answers. Some examples are:

$$\sqrt{20}, \pi, 1.3467 \dots$$

5)  $8^6$

6) a)  $3^7$   
b)  $z^4$

7) a) 125  
b) 6561

8) a)  $(-2)^4$   
b)  $-5^8$  or  $-(5^8)$  or  $-(5)^8$

9) a)  $-4096$   
b) 4096

10) a)  $3^5 \times b^3$   
b)  $(4a)^3 + 3b^3$  or  $(4a)^3 + 3(b^3)$

11) a)  $12^3 + 12^4$   
b)  $(a + b)^4$

12) a)  $9^{15}$   
b)  $a^7$

13) a)  $(-3)^7$   
b)  $4^4$

14) a)  $\left(\frac{2}{5}\right)^4$   
b)  $b^{m+p}$

15) a)  $-6m^7$   
b)  $-a^9b^7$

16) a)  $4^5$   
b)  $6^{11}$

17) a)  $m^{21}$   
b)  $ab^2$

18) a)  $3k^5$   
b)  $\frac{1}{5}ht$  or  $\frac{ht}{5}$  or  $0.2ht$

19) a)  $\frac{1}{3}a^2b^3$  or  $\frac{a^2b^3}{3}$   
b)  $-\frac{1}{2}a^4b^{-5}$  or  $-0.5a^4b^{-5}$  or  $-\frac{a^4}{2b^5}$