

Chapter 5

Exponents and Powers

Q2 Write the numbers as products of powers.

(a) 432

2	432
2	216
2	108
2	54
3	27
3	9
3	3

$$432 \Rightarrow 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

$$\Rightarrow 2^4 \times 3^3$$

(b) 5000

2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5

$$5000 \Rightarrow 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$$

$$\Rightarrow 2^3 \times 5^4$$

$$\text{Ans} \Rightarrow \text{Exponential form} \Rightarrow 2^3 \times 5^4$$

(c) 1568

2	1568
2	784
2	392
2	196
2	98
7	49
7	7

$$1568 \Rightarrow 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7$$

$$\Rightarrow 2^5 \times 7^2$$

$$\text{Ans} \Rightarrow \text{Exponential form} \Rightarrow 2^5 \times 7^2$$

(d) 10125

3	10125
3	3375
3	1125
3	375
5	125
5	25
5	5

$$10125 \Rightarrow 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$$

$$\Rightarrow 3^4 \times 5^3$$

$$\text{Ans} \Rightarrow \text{Exponential form} \Rightarrow 3^4 \times 5^3$$

Q3 Express the following as a product of prime factors in exponential form.

(a) 108×64

2	64
2	32
2	16
2	8
2	4
2	2
1	1

$$108 \Rightarrow 2 \times 2 \times 3 \times 3 \times 3$$

$$64 \Rightarrow 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$\text{Ans} \Rightarrow \text{Exponential form} \Rightarrow 108 \times 64 = 2^8 \times 3^3$$

Q.1 simplify and write in exponential form

(a) $5^{0.9} \times 5^{5.4}$
 $\Rightarrow 5^{(0.9+5.4)}$
 $\Rightarrow 5^{6.3}$
 Ans. $\Rightarrow 5^{6.3}$

(b) $(-9)^{15.7} \times 9^{2.3}$
 $\Rightarrow -(-9)^{(15.7+2.3)}$
 $\Rightarrow -(-9)^{18}$
 Ans. $\Rightarrow -(-9)^{18}$

(c) $(-7)^3 \times (-7)^{3.3}$
 $\Rightarrow (-7)^{3+3.3}$
 $\Rightarrow (-7)^{6.3}$
 Ans. $\Rightarrow (-7)^{6.3}$

(d) $6^{1.5} \times 6^{0.8}$
 $\Rightarrow 6^{(1.5+0.8)}$
 $\Rightarrow 6^{2.3}$
 Ans. $\Rightarrow 6^{2.3}$

(e) $(-4)^{16} \times (-4)^{44}$
 $\Rightarrow (-4)^{(16+44)}$
 $\Rightarrow (-4)^{60}$
 Ans. $\Rightarrow (-4)^{60}$

Q.2 simplify and express in exponential form

(a) $23^{20.7} \div 23^{15.8}$
 $\Rightarrow 23^{20.7-15.8}$
 $\Rightarrow 23^{4.9}$
 Ans. $\Rightarrow 23^{4.9}$

(b) $(-19)^{10.5} \div 19^{2.8}$
 $\Rightarrow -(-19)^{(10.5-2.8)}$
 $\Rightarrow -(-19)^{7.7}$
 Ans. $\Rightarrow -(-19)^{7.7}$

Q.3 simplify:

(a) $(9^2)^6$
 $\Rightarrow 9^{2 \times 6}$
 $\Rightarrow 9^{12}$
 Ans. $\Rightarrow 9^{12}$

(b) $(10^5)^{20}$
 $\Rightarrow 10^{5 \times 20}$
 $\Rightarrow 10^{100}$
 Ans. $\Rightarrow 10^{100}$

(c) 16^5
 $\Rightarrow (\frac{4^2}{2})^5$
 $\Rightarrow \frac{4^{10}}{2^5}$
 Ans. $\Rightarrow \frac{4^{10}}{2^5}$

(d) $(\frac{3}{8})^5$
 $\Rightarrow \frac{3^5}{8^5}$
 Ans. $\Rightarrow \frac{3^5}{8^5}$

(e) $-\frac{1}{(4)^{3.5}}$
 $\Rightarrow -\frac{1}{(4)^{3.5}}$
 Ans. $\Rightarrow -\frac{1}{(4)^{3.5}}$

(f) $\frac{(-4)^{120}}{(-4)^{85}}$
 $\Rightarrow (-4)^{120-85}$
 $\Rightarrow (-4)^{35}$
 Ans. $\Rightarrow (-4)^{35}$

(g) $(-a)^{8.3} \div (-a)^{6.7}$
 $\Rightarrow (-a)^{8.3-6.7}$
 $\Rightarrow (-a)^{1.6}$
 Ans. $\Rightarrow (-a)^{1.6}$

(h) $43^{22.2} \div 43^{12.2}$
 $\Rightarrow 43^{22.2-12.2}$
 $\Rightarrow 43^{10}$
 Ans. $\Rightarrow 43^{10}$

(i) $8^{(34-98)}$
 $\Rightarrow 8^{-64}$
 $\Rightarrow \frac{1}{8^{64}}$
 Ans. $\Rightarrow \frac{1}{8^{64}}$

(j) $(57)^{34} \div (-57)^{13}$
 $\Rightarrow -(-57)^{(34-13)}$
 $\Rightarrow -(-57)^{21}$
 Ans. $\Rightarrow -(-57)^{21}$

Q.10 Find n if:

(a) $(3^4)^5 = (3^2)^n$
 $\Rightarrow 3^{4 \times 5} = 3^{2 \times n}$
 $3^{20} = 3^{2n}$
 $2n = 20$
 $n = \frac{20}{2}$
 $n = 10$
 Ans. $\Rightarrow \boxed{n = 10}$

(b) $5^{12} = 5 \times 5 \times 5 \times 5 \times 5 \times 5$
 $5^{12} = 5^5$
 $12 = 5n$
 $\Rightarrow \frac{12}{5} = n$
 $\Rightarrow \frac{12}{5} = n$
 Ans. $\Rightarrow \boxed{n = \frac{12}{5}}$

(c) $7^{2n+4} = 7^4 \times 7^{12}$
 $7^{2n+4} = 7^4 \times 7^{12}$
 $2n+4 = 4+12$
 $2n+4 = 16$
 $2n = 16-4$
 $2n = 12$
 $n = \frac{12}{2}$
 $n = 6$
 $n = 4$
 Ans. $\Rightarrow \boxed{n = 4}$

Q.11 Express the following product in exponential form.

(a) $(-5)^{14} \times (-7)^{14}$
 Ans. $\Rightarrow (-5 \times -7)^{14}$
 $\Rightarrow 35^{14}$

(b) $a^8 \times (-b)^{19}$
 Ans. $\Rightarrow (-a \times b)^{19}$
 $\Rightarrow -a^{19} \times b^{19}$

(c) $3^{21} \times 5^{21}$
 Ans. $\Rightarrow (3 \times 5)^{21}$
 $\Rightarrow 15^{21}$

(d) $a^4 = 64^n$
 $a^4 = 8 \times 8^n$
 $a^4 = 8^{2n}$
 $4 = 2n$
 $\frac{4}{2} = n$
 $2 = n$
 Ans. $\Rightarrow \boxed{n = 2}$

(e) $(-7)^{32} \times (-9)^{32}$
 Ans. $\Rightarrow (-7 \times -9)^{32}$
 $\Rightarrow 63^{32}$

(f) $(-7)^{32} \times (-9)^{32}$
 Ans. $\Rightarrow 63^{32}$

Q12 Express the following as a product of exponential form in your answer. It gives, without using I as one of the factors of the product.

(a) $(-12)^{11}$

Ans $\Rightarrow$ a exponential form of $(-12)^{11}$ in your answer $\Rightarrow$ adjacent powers $\Rightarrow (3 \times 4)^{11}, (-3 \times 4)^{11}, (2 \times (-6))^{11}, (-2 \times 6)^{11}$

(b) $(-36)^{12}$

Ans $\Rightarrow$ a exponential form of $(-36)^{12}$ in your answer $\Rightarrow$ adjacent powers $\Rightarrow (-12 \times 3)^{12}, (-3 \times 12)^{12}, (-18 \times 2)^{12}, (-2 \times 18)^{12}$

Q13 Evaluate:

(a) $(-9)^4 \div 3^4$

Ans $\Rightarrow$ $(-9+3)^4$
 $\Rightarrow (15 \div 5)^5 \times 5^2$
 $\Rightarrow 5^8 \times 5^2$
 $\Rightarrow 5^{8+2}$
 $\Rightarrow 5^{10}$

(c) $(7^0 + 12^0) \times 6^0$

Ans $\Rightarrow$ $(25^0 + 32^0) \div 22^0$
 $\Rightarrow 1+1 \div 1$
 $\Rightarrow 2 \div 1$
 $\Rightarrow 2$

Q14 Express 36^4 as an exponential with base 6.

Ans $\Rightarrow$ $(36)^4$
 $\Rightarrow (6 \times 6)^4$
 $\Rightarrow (6^2)^4$
 $\Rightarrow 6^8$

Q15 Express 125^{12} as an exponential with base 5.

Ans $\Rightarrow$ 125^{12}
 $\Rightarrow (5 \times 5 \times 5)^{12}$
 $\Rightarrow (5^3)^{12}$
 $\Rightarrow 5^{36}$

(c) Write 27^8 as an exponential with base 3.

Ans $\Rightarrow$ 27^8
 $\Rightarrow (3 \times 3 \times 3)^8$
 $\Rightarrow (3^3)^8$
 $\Rightarrow 3^{24}$

(d) Write 9^6 as an exponential with base 3.

Ans $\Rightarrow$ 9^6
 $\Rightarrow \overbrace{9 \times 9 \times 9 \times 9 \times 9 \times 9}^6$
 $\Rightarrow (9 \times 9)^6 (9 \times 9)^3$
 $\Rightarrow 81^3$



$$\Rightarrow \frac{1}{3^0} \times \frac{1}{2^0} \times \frac{1}{5^0} = 1$$

$$\Rightarrow \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$\Rightarrow \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$(d) \quad (3^5 \times 10^5 \times 2^5) \div (5^7 \times 6^5)$$

$$\Rightarrow \frac{3^5 \times 2^5 \times 5^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5 \times 2^5 \times 5^5} = 1$$

$$(a) \quad \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$\Rightarrow \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$(b) \quad 10^6 \div 3^2$$

$$= \frac{10^6}{3^2}$$

$$(i) \quad (2^5 \times 4^4 \times 9^3) \div (5^3 \times 4^4 \times 9^3)$$

$$\Rightarrow \frac{2^5 \times 4^4 \times 9^3}{2^5 \times 4^4 \times 9^3} = 1$$

$$(f) \quad \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$\Rightarrow \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$(g) \quad 10^6 \div 3^2$$

$$\Rightarrow \frac{10^6}{3^2}$$

$$(h) \quad \frac{2^5 \times 4^4 \times 9^3}{2^5 \times 4^4 \times 9^3} = 1$$

$$(i) \quad \frac{3^5 \times 2^5 \times 5^5}{3^5 \times 2^5 \times 5^5} = 1$$

$$\Rightarrow \frac{2^6 \times 2^5 \times 5^5}{2^3 \times 5^4}$$

$$\Rightarrow \frac{(2^3)^3 \times 2^5 \times 5^5}{2^3 \times 5^4}$$

$$\Rightarrow \frac{(2 \times 2^3)^3 \times (2 \times 5)^5}{2^3 \times 5^4}$$

$$(a) \frac{4^3 \times 10^5}{2^3 \times 5^4}$$

Q.17 simplify and write the answer in exponential form

$$\Rightarrow \frac{2^{24} \times 2^8}{2^{24} \times 2^8 \times 1}$$

$$\Rightarrow \frac{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}$$

$$\Rightarrow \frac{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}$$

$$\Rightarrow \frac{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}$$

$$\Rightarrow \frac{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}$$

$$\Rightarrow \frac{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}{2^{24} \times 2^8 \times 2^8 \times 2^8 \times 2^8}$$

$$\Rightarrow \frac{2^{10} \times 5^2 \times a^6}{2^3}$$

$$\Rightarrow \frac{(2^{10-3}) \times 5^2 \times a^6}{1}$$

$$\Rightarrow \frac{2^7 \times 5^2 \times a^6}{1}$$

$$\Rightarrow \frac{2^7 \times 5^2 \times a^6}{1}$$

$$\Rightarrow \frac{(2 \times 2^3)^7 \times (5 \times 5)^2 \times a^6}{1}$$

$$\Rightarrow \frac{6^7 \times 5^2 \times a^6}{1}$$

$$(b) \frac{(6^7)^4 \times 5^8 \times a^6}{9^9 \times 10^6}$$

$$\Rightarrow \frac{2^8 \times 3^8 \times 5^8 \times a^6}{2^8 \times 3^8 \times 5^8 \times a^6}$$

$$\Rightarrow \frac{2^8 \times 3^8 \times 5^8 \times a^6}{2^8 \times 3^8 \times 5^8 \times a^6}$$

$$\Rightarrow \frac{2^8 \times 3^8 \times 5^8 \times a^6}{2^8 \times 3^8 \times 5^8 \times a^6}$$

$$\Rightarrow \frac{2^8 \times 2^4 \times 3^4}{2^{12} \times 2^4 \times 3^4}$$

$$\Rightarrow \frac{2^8 \times 2^4 \times 3^4}{(2^3)^4 \times 2^4 \times 3^4}$$

$$\Rightarrow \frac{2^8 \times 2^4 \times 3^4}{(2 \times 2 \times 2)^4 \times (2 \times 3)^4}$$

$$(d) \frac{8^4 \times 6^4}{2^8 \times 3^8}$$

$$\Rightarrow \frac{3^{24} \times 2^{24} \times 5^8}{3^{24} \times 2^{24} \times 5^8}$$

$$\Rightarrow \frac{3^{24-24} \times 2^{24-24} \times 5^{8-8}}{3^{24-24} \times 2^{24-24} \times 5^{8-8}}$$

$$\Rightarrow \frac{3^{24} \times 2^{24} \times 5^{20}}{5^{24} \times 2^8 \times 3^{20}}$$

$$\Rightarrow \frac{3^{(24+12+12)} \times 2^{(24+4)} \times 5^{20}}{5^{24} \times 2^8 \times 3^{(16+4)}}$$

$$\Rightarrow \frac{3^{48} \times 2^{28} \times 5^{20}}{5^{24} \times 2^8 \times 3^{20}}$$

$$\Rightarrow \frac{3^{32} \times 2^{20} \times 5^{12} \times 2^8 \times 3^{16} \times 2^4 \times 3^{12}}{5^{24} \times 2^8 \times 3^{20}}$$

$$\Rightarrow \frac{(3 \times 5)^{32} \times (2 \times 3 \times 5)^{16} \times (2 \times 3 \times 5)^8 \times (2 \times 3)^2}{(5 \times 5)^{12} \times (2 \times 3 \times 5)^8 \times (2 \times 3)^2}$$

$$(c) \frac{15^{32} \times 12^{15} \times 5^4}{25^{12} \times 18^8 \times 9^2}$$

$$\Rightarrow \frac{2^{16} \times 3^{10} \times 5^6}{2^{16} \times 3^{10} \times 5^6}$$

$$(f) \frac{2^{16} \times 3^{10} \times 5^6}{2^{16} \times 3^{10} \times 5^6}$$

$$\Rightarrow \frac{2^{24} \times 3^7 \times 5^2}{2^{24} \times 3^7 \times 5^2}$$

$$\Rightarrow \frac{2^{(24-9)} \times 3^{(20-13)} \times 5^{(6-4)}}{2^{(24-9)} \times 3^{(20-13)} \times 5^{(6-4)}}$$

$$\Rightarrow \frac{2^{15} \times 3^7 \times 5^2}{2^{15} \times 3^7 \times 5^2}$$

$$\Rightarrow \frac{2^9 \times 3^{13} \times 5^4}{2^9 \times 3^{13} \times 5^4}$$

$$\Rightarrow \frac{2^{36} \times 3^{20} \times 5^6}{2^{36} \times 3^{20} \times 5^6}$$

$$\Rightarrow \frac{2^{29} \times 3^9 \times 5^4}{2^{29} \times 3^9 \times 5^4}$$

$$\Rightarrow \frac{(2 \times 3)^{12} \times (3 \times 5)^{10} \times 5^6}{(2 \times 3)^{12} \times (3 \times 5)^{10} \times 5^6}$$

$$(e) \frac{10^{10} \times (2^2)^5 \times 5^6}{6^3 \times 15^4}$$

$$\Rightarrow \frac{2^8 \times 3^1}{2^{(12+4-8)} \times 3^{(4-3)}}$$



Shot on Y83 Pro
vivo dual camera

$$\Rightarrow \left(\frac{7}{2}\right)^{10} \times \left(\frac{7}{2}\right)^{2n-6} = \left(\frac{7}{2}\right)^{16}$$

$$\Rightarrow \left[\left(\frac{7}{2}\right)^5\right]^5 \times \left[\left(\frac{7}{2}\right)^2\right]^{n-3} = \left(\frac{7}{2}\right)^{16}$$

$$(a) \left(\frac{49}{4}\right)^5 \times \left(\frac{49}{4}\right)^{n-3} = \left(\frac{7}{2}\right)^{16}$$

0.18 find n if:

$$\Rightarrow 3^{35} \times 7^{16} \times 2^{20} \times 5^3$$

$$\Rightarrow 3^{(6-11)} \times 7^{(4-8)} \times 2^{(24-18)} \times 5^{(8-5)}$$

$$\Rightarrow \frac{3^{16} \times 7^{24} \times 2^{68} \times 5^8}{7^8 \times 3^{11} \times 5^5 \times 2^{18}}$$

$$\Rightarrow \frac{3^{(16-11)} \times 7^{(24-8)} \times 2^{(68-18)} \times 5^{(8-5)}}{7^8 \times 3^{35} \times 5^5 \times 2^{10} \times 3^6}$$

$$\Rightarrow \frac{3^{16} \times 7^{16} \times 2^{50} \times 5^8 \times 7^8 \times 2^{30} \times 3^6}{7^8 \times 3^{35} \times 5^5 \times 2^{10} \times 3^6}$$

$$\Rightarrow \frac{3^{16} \times 7^{16} \times 2^{50} \times 5^8 \times 7^8 \times (2^3)^6 \times 3^6}{(2^3)^4 \times 3^5 \times 5^5 \times (2^3)^6 \times 3^6}$$

$$\Rightarrow \frac{(3 \times 7)^{16} \times (2 \times 5 \times 7)^8 \times 3^6 \times (2 \times 2 \times 3 \times 5)^{15}}{(2 \times 7)^4 \times (2 \times 5)^5 \times (2 \times 2 \times 3 \times 5)^6}$$

$$10 = 2n$$

$$4+6 = 2n$$

$$4 = 2n-6$$

on comparing exponents

$$\left(\frac{5}{7}\right)^4 = \left(\frac{5}{7}\right)^{2n-6}$$

$$\left(\frac{5}{7}\right)^{-12+6} = \left(\frac{5}{7}\right)^{2n-6}$$

$$\Rightarrow \left(\frac{5}{7}\right)^{-12} \times \left(\frac{5}{7}\right)^6 = \left(\frac{5}{7}\right)^{2n-6}$$

$$(b) \left(\frac{5}{7}\right)^{12} \times \left[\left(\frac{5}{7}\right)^6\right]^8 = \left(\frac{5}{7}\right)^{2n-6}$$

$$n = 6$$

$$n = \frac{12}{2}$$

$$2n = 12$$

$$4+2n = 16$$

on comparing exponents

$$\left(\frac{7}{2}\right)^{4+2n} = \left(\frac{7}{2}\right)^{16}$$

$$\frac{7}{2}^{(10-6+2n)} = \left(\frac{7}{2}\right)^{16}$$

$$\left(\frac{7}{2}\right)^{(10+2n-6)} = \left(\frac{7}{2}\right)^{16}$$



$$\Rightarrow \left(\frac{5}{3}\right)^{(20+(-10))} = \left(\frac{5}{3}\right)^{3n-13}$$

$$\Rightarrow \left(\frac{5}{3}\right)^{20} \times \left(\frac{5}{3}\right)^{10} = \left(\frac{5}{3}\right)^{3n-13}$$

$$(d) \left(\frac{5}{3}\right)^{20} \times \left[\left(\frac{5}{3}\right)^3\right]^4 = \left(\frac{5}{3}\right)^{3n-13}$$

$$\boxed{n = 2}$$

$$\frac{n}{2} = \frac{2}{2}$$

$$n = 4$$

$$2n = 8$$

$$3n = 12$$

on comparing exponents

$$\left(\frac{5}{3}\right)^{8+2n} = \left(\frac{5}{3}\right)^{12}$$

$$\Rightarrow \left(\frac{5}{3}\right)^8 \times \left(\frac{5}{3}\right)^{2n} = \left(\frac{5}{3}\right)^{12}$$

$$\Rightarrow \left[\left(\frac{5}{3}\right)^2\right]^4 \times \left[\left(\frac{5}{3}\right)^2\right]^n = \left(\frac{5}{3}\right)^{12}$$

$$(a) \left(\frac{5}{9}\right)^4 \times \left(\frac{5}{9}\right)^n = \left(\frac{5}{9}\right)^{12}$$

$$\boxed{5 = n}$$

$$\frac{10}{2} = n$$

$$\Rightarrow 5 \times 10^6 + 4 \times 10^5 + 6 \times 10^4 + 2 \times 10^3 + 10 \times 10^1$$

$$\Rightarrow 500000 + 40000 + 6000 + 200 + 10$$

$$(b) 5462010$$

$$\Rightarrow 3 \times 10^6 + 2 \times 10^5 + 1 \times 10^4 + 8 \times 10^3 + 9 \times 10^2$$

$$\Rightarrow 3000000 + 200000 + 10000 + 8000 + 900$$

$$(c) 32,10,089$$

Q.1 Write the following numbers in expanded form using exponents of 10.

Exercise 5.2

$$\boxed{5 = 5n}$$

$$\frac{5}{3} = n$$

$$\frac{15}{3} = 3n$$

$$2+13 = 3n$$

$$2 = 3n-13$$

on comparing exponents

$$\left(\frac{5}{3}\right)^2 = \left(\frac{5}{3}\right)^{3n-13}$$

$$\left(\frac{5}{3}\right)^{(20-18)} = \left(\frac{5}{3}\right)^{(3n-13)}$$

Q.2 Find the numbers

(a) $(4 \times 10^5) + (3 \times 10^5) + (7 \times 10^5)$

$\Rightarrow 400000 + 300 + 7$

Ans $\Rightarrow 400307$

(b) $(3 \times 10^4) + (8 \times 10^3) + (1 \times 10^1)$

$\Rightarrow 300000 + 800 + 10$

Ans $\Rightarrow 300810$

Q.3 (a) Express one light year = 946000000000 km in standard form.

Ans $\Rightarrow 946000000000 \text{ km standard form}$
 $\text{is } 9.46 \times 10^{12}$

(b) The area of the USA is 9834000 square kilometres and the area of India is 3287000 square kilometres. Compare the areas in the standard form and compare them.

Area of U.S.A = 9834000 sq. km
 $= 9.834 \times 10^6 \text{ sq. km}$

Area of India = 3287000 sq. km
 $= 3.28700 \times 10^6 \text{ sq. km}$

Ans $\Rightarrow$ Area of USA is longer than India

Q.4 Write the numbers in standard form.

(a) 2371.2×10^{28}

$\Rightarrow 2371.2 \times 10^{28}$

(b) $2.3712 \times 10^{28+3}$

$\Rightarrow 2.3712 \times 10^{31}$

(c) 0.0678×10^{15}

$\Rightarrow 0.0678 \times 10^{15}$

$\Rightarrow 6.78 \times 10^{14}$

(d) 6.78×10^{14}

Ans $\Rightarrow 6.78 \times 10^{14}$

Q.5 The population

compare them.

The population of India $\Rightarrow 13,00,000,000$

The population of USA $\Rightarrow 320,000,000$

standard form $\Rightarrow 3.2 \times 10^8$

Compare between USA and India

Ans India's population is $\Rightarrow 0.32 \times 10^9$

greater than USA

Q.6 Brazil produced

the resources.

Brazil produces coffee $\Rightarrow 2.5 \times 10^5$

India produces coffee $\Rightarrow 3.5 \times 10^5$

Compare between

$\Rightarrow$ Brazil $>$ India
 $\Rightarrow 2.5 \times 10^5 > 3.5 \times 10^5$

Ans So, Brazil produce more than India

