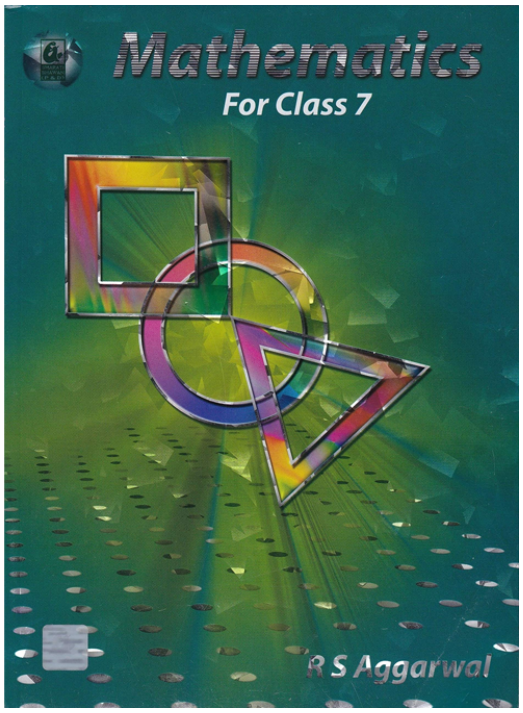
RS Aggarwal Solutions for Class 7 Maths Chapter 5–Exponents

Class 7 - Chapter 5 Exponents



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RS Aggarwal Solutions for Class 7 Maths Chapter 5–Exponents

Class 7: Maths Chapter 5 solutions. Complete Class 7 Maths Chapter 5 Notes.

RS Aggarwal Solutions for Class 7 Maths Chapter 5–Exponents

RS Aggarwal 7th Maths Chapter 5, Class 7 Maths Chapter 5 solutions

Ex 5A

Question 1.

Solution:

$$(i)\ \frac{5}{7}\times\frac{5}{7}\times\frac{5}{7}\times\frac{5}{7}=\left(\frac{5}{7}\right)^4$$

$$(ii)\ \left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)=\left(\frac{-4}{3}\right)^5$$

$$(iii)\ \left(\frac{-1}{6}\right)\times\left(\frac{-1}{6}\right)\times\left(\frac{-1}{6}\right)=\left(\frac{-1}{6}\right)^3$$

$$(iv)\ (-8)\times(-8)\times(-8)\times(-8)\times(-8)=(-8)^5$$

Question 2.

Solution:

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$$(i)\ \frac{25}{36}=\frac{5\times5}{6\times6}=\frac{5}{6}\times\frac{5}{6}=\left(\frac{5}{6}\right)^2$$

$$(ii)\ \frac{-27}{64}=\frac{(-3)\times(-3)\times(-3)}{4\times4\times4}=\left(\frac{-3}{4}\right)\times\left(\frac{-3}{4}\right)\times\left(\frac{-3}{4}\right)=\left(\frac{-3}{4}\right)^3$$

$$(iii)\ \frac{-32}{243}=\frac{(-2)\times(-2)\times(-2)\times(-2)\times(-2)}{3\times3\times3\times3\times3}$$

2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

3 | 243
3 | 81
3 | 27
3 | 9
3 | 3
1

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

$$(iv)\ \frac{-1}{128}=\frac{(1\times1\times1\times1\times1\times1\times1)}{2\times2\times2\times2\times2\times2\times2}$$

2 | 128
2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

$$=\frac{(-1)\times(1-)\times(-1)\times(-1)\times(-1)\times(-1)\times(-1)}{2\times2\times2\times2\times2\times2\times2}$$

$$=\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)$$

$$=\left(\frac{-1}{2}\right)^7$$

Question 3.

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Solution:

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

$$= \frac{2\times2\times2\times2\times2}{3\times3\times3\times3\times3} = \frac{32}{243}$$

$$(ii)\ \left(\frac{-8}{5}\right)^3 = \frac{-8}{5}\times\frac{-8}{5}\times\frac{-8}{5}$$

$$= \frac{(-8)\times(-8)\times(-8)}{5\times5\times5} = \frac{-512}{125}$$

$$(iii)\ \left(\frac{-13}{11}\right)^2 = \frac{-13}{11}\times\frac{-13}{11}$$

$$= \frac{(-13)\times(-13)}{11\times11} = \frac{169}{121}$$

$$(iv)\ \left(\frac{1}{6}\right)^3 = \frac{1}{6}\times\frac{1}{6}\times\frac{1}{6} = \frac{1\times1\times1}{6\times6\times6} = \frac{1}{216}$$

$$(v)\ \left(\frac{-1}{2}\right)^5 = \frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}$$

$$= \frac{(-1)\times(-1)\times(-1)\times(-1)\times(-1)}{2\times2\times2\times2\times2} = \frac{-1}{32}$$

$$(vi)\ \left(\frac{-3}{2}\right)^4 = \frac{-3}{2}\times\frac{-3}{2}\times\frac{-3}{2}\times\frac{-3}{2}$$

$$= \frac{(-3)\times(-3)\times(-3)\times(-3)}{2\times2\times2\times2} = \frac{81}{16}$$

$$(vii)\ \left(\frac{-4}{7}\right)^3 = \frac{-4}{7}\times\frac{-4}{7}\times\frac{-4}{7}$$

$$= \frac{(-4)\times(-4)\times(-4)}{7\times7\times7} = \frac{-64}{343}$$

$$(viii)\ (-1)^9 =$$
$$(-1)\times(-1)\times(-1)\times(-1)\times(-1)\times(-1)\times(-1)\times(-1)\times(-1)$$
$$= -1$$

Question 4.

Solution:

$$(i)\ (4)^{-1} = \left(\frac{1}{4}\right)^1 = \frac{1}{4}$$

$$(ii)\ (-6)^{-1} = \left(\frac{1}{-6}\right)^1 = \frac{1}{-6} = \frac{1\times(-1)}{-6\times(-1)}$$

$$= \frac{-1}{6}$$

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

$$(iv)\ \left(\frac{-2}{3}\right)^{-1} = \left(\frac{3}{-2}\right)^1 = \frac{3}{-2} = \frac{3\times(-1)}{-2\times(-1)}$$

$$= \frac{-3}{2}$$

Question 5.

Solution:

$$(i)\ \left(\frac{3}{8}\right)^4 = \left(\frac{8}{3}\right)^4$$

$$(ii)\ \left(\frac{-5}{6}\right)^{11} = \left(\frac{-6}{5}\right)^{11}$$

$$(iii)\ 6^7 = \left(\frac{1}{6}\right)^7$$

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

Question 6.

Solution:

We know that $\left(\frac{a}{b}\right)^0 = 1$, therefore

(*i*) $8^0 = 1$
(*ii*) $(-3)^0 = 1$
(*iii*) $4^0 + 5^0 = 1 + 1 = 2$
(*iv*) $6^0 \times 7^0 = 1 \times 1 = 1$

Question 7.

Solution:

(i) $\left(\frac{3}{2}\right)^4 \times \left(\frac{1}{5}\right)^2 = \frac{3}{2}\times\frac{3}{2}\times\frac{3}{2}\times\frac{3}{2}\times\frac{1}{5}\times\frac{1}{5}$

$= \frac{81}{400}$

(ii) $\left(\frac{-2}{3}\right)^5 \times \left(\frac{-3}{7}\right)^3$

$= \frac{-2}{3}\times\frac{-2}{3}\times\frac{-2}{3}\times\frac{-2}{3}\times\frac{-2}{3}\times\frac{-3}{7}\times\frac{-3}{7}\times\frac{-3}{7}$

$= \frac{-32}{243}\times\frac{-27}{343} = \frac{(-32)\times(-27)}{243\times343}$

$= \frac{32\times1}{9\times343} = \frac{32}{3087}$

(iii) $\left(\frac{-1}{2}\right)^5 \times 2^3 \times \left(\frac{3}{4}\right)^2$

$= \frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}\times\frac{-1}{2}\times 2\times2\times2\times \frac{3}{4}\times\frac{3}{4}$

$= \frac{-1}{32}\times8\times\frac{9}{16} = \frac{-1\times9}{4\times16} = \frac{-9}{64}$

(iv) $\left(\frac{2}{3}\right)^2 \times \left(\frac{-3}{5}\right)^3 \times \left(\frac{7}{2}\right)^2$

$= \frac{2}{3}\times\frac{2}{3}\times\frac{-3}{5}\times\frac{-3}{5}\times\frac{-3}{5}\times\frac{7}{2}\times\frac{7}{2}$

$= \frac{4}{9}\times\frac{-27}{125}\times\frac{49}{4} = \frac{4\times(-27)\times49}{9\times125\times4}$

$$= \frac{-3\times 49}{125} = \frac{-147}{125}$$

(v) $\left\{\left(\frac{-3}{4}\right)^3 - \left(\frac{-5}{2}\right)^3\right\}\times 4^2$

$$= \left\{\left(\frac{-3}{4}\times\frac{-3}{4}\times\frac{-3}{4}\right) - \left(\frac{-5}{2}\times\frac{-5}{2}\times\frac{-5}{2}\right)\right\} \times 4\times 4$$

$$= \left\{\frac{-27}{64} - \frac{-125}{8}\right\}\times 16$$

$$= \frac{-27+1000}{64}\times 16 \text{ (LCM of 64 and } 8 = 64)$$

$$= \frac{973}{4}$$

Question 8.

Solution:

(i) $\left(\frac{4}{9}\right)^6 \times \left(\frac{4}{9}\right)^{-4} = \left(\frac{4}{9}\right)^{6-4} = \left(\frac{4}{9}\right)^2$

$= \frac{4}{9}\times\frac{4}{9} = \frac{16}{81}$

(ii) $\left(\frac{-7}{8}\right)^{-3} \times \left(\frac{-7}{8}\right)^2 = \left(\frac{-7}{8}\right)^{-3+2}$

$= \left(\frac{-7}{8}\right)^{-1} = \left(\frac{8}{-7}\right)^1 = \frac{8}{-7}$

$= \frac{8\times(-1)}{-7\times(-1)} = \frac{-8}{7}$

(iii) $\left(\frac{4}{3}\right)^{-3} \times \left(\frac{4}{3}\right)^{-2} = \left(\frac{3}{4}\right)^3 \times \left(\frac{3}{4}\right)^2$

$= \left(\frac{3}{4}\right)^{3+2} = \left(\frac{3}{4}\right)^5 = \frac{3}{4}\times\frac{3}{4}\times\frac{3}{4}\times\frac{3}{4}\times\frac{3}{4}$

$= \frac{243}{1024}$

Question 9.

Solution:

$$= \left(\frac{(-1)\times(-1)\times(-1)\times(-1)\times(-1)}{2\times2\times2\times2\times2}\right)$$

$$= \frac{-1}{32}$$

$$(iii)\ \left(\frac{1}{4}\right)^{-4} = (4)^4 = 4\times4\times4\times4 = 256$$

$$(iv)\ \left(\frac{-3}{4}\right)^{-3} = \left(\frac{-4}{3}\right)^{3}$$

$$= \left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)\times\left(\frac{-4}{3}\right)$$

$$= \frac{(-4)\times(-4)\times(-4)}{3\times3\times3} = \frac{-64}{27}$$

$$(v)\ (-3)^{-1}\times\left(\frac{1}{3}\right)^{-1} = \left(\frac{1}{-3}\right)^{1}\times(3)^{1}$$

$$= \frac{-1}{3}\times3 = -1$$

$$(vi)\ \left(\frac{5}{7}\right)^{-1}\times\left(\frac{7}{4}\right)^{-1} = \left(\frac{7}{5}\right)^{1}\times\left(\frac{4}{7}\right)^{1}$$

$$= \frac{7}{5}\times\frac{4}{7} = \frac{4}{5}$$

$$(i)\ 5^{-3} = \left(\frac{1}{5}\right)^{3} = \frac{1}{5}\times\frac{1}{5}\times\frac{1}{5} = \frac{1}{125}$$

$$(ii)\ (-2)^{-5} = \left(\frac{1}{-2}\right)^{5} = \left(\frac{1\times(-1)}{-2\times(-1)}\right)^{5}$$

$$= \left(\frac{-1}{2}\right)^{5}$$

$$= \left[\left(\frac{3}{4}\right)^{1} - \left(\frac{4}{1}\right)\right]^{-1} = \left[\frac{3}{4} - \frac{4}{1}\right]^{-1}$$

(vii) $(5^{-1} - 7^{-1})^{-1} = \left(\frac{1}{5} - \frac{1}{7}\right)^{-1}$ $= \left[\frac{3-16}{4}\right]^{-1} = \left[\frac{-13}{4}\right]^{-1} = \frac{-4}{13}$

$= \left(\frac{7-5}{35}\right)^{-1} = \left(\frac{2}{35}\right)^{-1}$ (ix) $\left\{\left(\frac{3}{2}\right)^{-1} \div \left(\frac{-2}{5}\right)^{-1}\right\}$

$= \left(\frac{35}{2}\right)^{1} = \frac{35}{2}$ $= \left[\left(\frac{2}{3}\right)^{1} \div \left(\frac{5}{-2}\right)^{1}\right] = \frac{2}{3} \times \frac{-2}{5} = \frac{-4}{15}$

(viii) $\left\{\left(\frac{4}{3}\right)^{-1} - \left(\frac{1}{4}\right)^{-1}\right\}^{-1}$ (x) $\left(\frac{23}{25}\right)^{0} = 1$

Question 10.

Solution:

(i) $\left[\left\{\left(\frac{-1}{4}\right)^{2}\right\}^{-2}\right]^{-1} = \left[\left(\frac{-1}{4}\right)^{2\times(-2)}\right]^{-1}$

$= \left[\left(\frac{-1}{4}\right)^{-4}\right]^{-1} = \left(\frac{-1}{4}\right)^{-4\times(-1)} = \left(\frac{-1}{4}\right)^{4}$

$= \frac{-1}{4} \times \frac{-1}{4} \times \frac{-1}{4} \times \frac{-1}{4} = \frac{1}{256}$

(ii) $\left\{\left(\frac{-2}{3}\right)^{2}\right\}^{3} = \left(\frac{-2}{3}\right)^{2\times3} = \left(\frac{-2}{3}\right)^{6}$

$= \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} = \frac{64}{729}$

(iii) $\left(\frac{-3}{2}\right)^{3} \div \left(\frac{-3}{2}\right)^{6} = \left(\frac{-3}{2}\right)^{3-6} = \left(\frac{-3}{2}\right)^{-3}$

$= \left(\frac{-2}{3}\right)^{3} = \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} = \frac{-8}{27}$

(iv) $\left(\frac{-2}{3}\right)^{7} \div \left(\frac{-2}{3}\right)^{4} = \left(\frac{-2}{3}\right)^{7-4} = \left(\frac{-2}{3}\right)^{3}$

$= \frac{-2}{3} \times \frac{-2}{3} \times \frac{-2}{3} = \frac{-8}{27}$

Question 11.

Solution:

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Product of two numbers $= (8)^{-1} = \frac{1}{8}$

One number $= (-5)^{-1} = \frac{-1}{5}$

$\therefore$ Second number $= \frac{1}{8} \div \left(\frac{-1}{5}\right) = \frac{1}{8} \times \frac{-5}{1}$

$= \frac{-5}{8}$

Question 12.

Solution:

Product of two numbers = 4

One number $= 3^{-3} = \left(\frac{1}{3}\right)^3 = \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3}$

$= \frac{1}{27}$

$\therefore$ Second number $= 4 \div \frac{1}{27} = 4 \times \frac{27}{1} = 108$

Question 13.

Solution:

The required number $= (-30)^{-1} \div (6)^{-1}$

$= \frac{-1}{30} \div \frac{1}{6} = \frac{-1}{30} \times \frac{6}{1}$

$= \frac{-1}{5}$

Question 14.

Solution:

$$\left(\frac{3}{5}\right)^{3} \times \left(\frac{3}{5}\right)^{-6} = \left(\frac{3}{5}\right)^{2x-1}$$

$$\Rightarrow \quad \left(\frac{3}{5}\right)^{3-6} = \left(\frac{3}{5}\right)^{2x-1}$$

$$\Rightarrow \quad \left(\frac{3}{5}\right)^{-3} = \left(\frac{3}{5}\right)^{2x-1}$$

Comparing we get

$2x - 1 = -3 \quad \Rightarrow 2x = -3 + 1$

$\Rightarrow 2x = -2 \quad \Rightarrow x = \frac{-2}{2} = -1$

Hence $x = -1$

Question 15.

Solution:

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5} = \frac{3^5 \times (2 \times 5)^5 \times 5^2}{5^7 \times (2 \times 3)^5}$$

$$= \frac{3^5 \times 2^5 \times 5^5 \times 5^2}{5^7 \times 2^5 \times 3^5}$$

$= 2^{5-5} \times 3^{5-5} \times 5^{5+2-7}$

$= 2^0 \times 3^0 \times 5^0 = 1 \times 1 \times 1 = 1$

Question 16.

Solution:

$$\frac{16\times 2^{n+1}-4\times 2^{n}}{16\times 2^{n+2}-2\times 2^{n+2}}$$

$$=\frac{2^{4}\times 2^{n+1}-2^{2}\times 2^{n}}{2^{4}\times 2^{n+2}-2\times 2^{n+2}}$$

$$=\frac{2^{n+1+4}-2^{n+2}}{2^{n+2+4}-2^{n+2+1}}$$

$$=\frac{2^{n+5}-2^{n+2}}{2^{n+6}-2^{n+3}}=\frac{2^{n}.2^{5}-2^{n}.2^{2}}{2^{n}.2^{6}-2^{n}.2^{3}}$$

$$=\frac{2^{n}\left(2^{5}-2^{2}\right)}{2^{n}\left(2^{6}-2^{3}\right)}=\frac{2^{5}-2^{2}}{2^{6}-2^{3}}$$

$$=\frac{32-4}{64-8}=\frac{28}{56}=\frac{1}{2}$$

Question 17.

Solution:

(*i*) $5^{2n}\times 5^{3}=5^{9}$

$\Rightarrow 5^{2n+3}=5^{9}$

Comparing we get,

$2n+3=9\Rightarrow 2n=9-3$

$\Rightarrow 2n=6\Rightarrow n=\frac{6}{2}=3$

$\therefore n=3$

(*ii*) $8\times 2^{n+2}=32$

$2^{n+2}=\frac{32}{8}=4=2^{2}$

Comparing we get,

$n+2=2\Rightarrow n=2-2=0$

$\therefore n=0$

(*iii*) $6^{2n+1}+36=6^{3}$

$\Rightarrow 6^{2n+1}+6^{2}=6^{3}$

$\Rightarrow 6^{2n+1-2}=6^{3}$

$\Rightarrow 6^{2n-1}=6^{3}$

Comparing we get

$2n-1=3\Rightarrow 2n=3+1=4$

$\Rightarrow n=\frac{4}{2}=2$

$\therefore n=2$

Question 18.

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Solution:

$$2^{n-7} \times 5^{n-4} = 1250$$
$$\Rightarrow 2^{n-4-3} \times 5^{n-4} = 1250$$
$$\Rightarrow 2^{n-4} \times \frac{1}{2^3} \times 5^{n-4} = 1250$$
$$(2 \times 5)^{n-4} = 1250 \times 2^3 = 1250 \times 8$$
$$10^{n-4} = 10000 = 10^4$$

Comparing we get,

$$n - 4 = 4 \Rightarrow n = 4 + 4 = 8$$
$$\therefore n = 8$$

Ex 5B

Question 1.

Solution:

We can write in standard form

(i) 538 = 5.38 x 10^2

(ii) 6428000 = 6.428000 x 10^6 = 6.428 x 10^6

(iii) 82934000000 = 8.2934000000 x 10^{10} = 8.2934 x 10^{10}

(iv) 940000000000 = 9.40000000000 x 10^{11} = 9.4 x 10^{11}

(v) 23000000 = 2.3000000 x 10^7 = 2.3 x 10^7

Question 2.

Solution:

(i) Diameter of Earth = 12756000 m = 1.2756000 x 10^7m = 1.2756 x 10^7 m

(ii) Distance between Earth and Moon = 384000000 m = 3.84000000 x 10^8 = 3.84 x 10^8

(iii) Population of India in March 2001 = 1027000000 = 1.027000000 x 10^9 = 1.027 x 10^9

(iv) Number of stars in a galaxy = 100000000000 = 1.00000000000 x 10^{11} = 1 x 10^{11}

(v) The present age of universe = 12000000000 years = 1.2000000000 x 10^{10} years = 1.2 x 10^{10} years

Question 3.

Solution:

The expanded form will be

(i) 684502 = 6 x 10^5 + 8 x 10^4 + 4 x 10^3 + 5 x 10^2 + 2

(ii) 4007185 = 4 x 10^6 + 0 x 10^5 + 0 x 10^4 + 7 x 10^3 + 1 x 10^2 + 8 x 10^1 + 5 x 10^0

(iii) 5807294 = 5 x 10^6 + 8 x 10^5 + 0 x 10^4 + 7 x 10^3 + 2 x 10^2 + 9 x 10^1 + 4 x 10^0

(iv) 50074 = 5 x 10^4 + 0 x 10^3 + 0 x 10^2 + 7 x 10^1 + 4 x 10^0

Question 4.

Solution:

(i) 6 x 10^4 + 3 x 10^3 + 0 x 10^2 + 7 x 10^1 + 8 x 10^0

= 60000 + 3000 + 0 + 70 + 8

= 63078

(ii) 9 x 10^6 + 7 x 10^5 + 0 x 10^4 + 3 x 10^3 + 4 x 10^2 + 6 x 10^1 + 2 x 10^0

= 9000000 + 700000 + 0 + 3000 + 400 + 60 + 2

= 9703462

(iii) 8 x 10^5 + 6 x 10^4 + 4 x 10^3 + 2 x 10^2 + 9 x 10^1 + 6 x 10^0

= 800000 + 60000 + 4000 + 200 + 90 + 6

= 864296

Ex 5C

OBJECTIVE QUESTIONS

Mark (✓) tick against the correct answer in each of the following :

Question 1.

Solution:

(d)

$$\because (6^{-1}-8^{-1})^{-1} = \left(\frac{1}{6}-\frac{1}{8}\right)^{-1} = \left(\frac{4-3}{24}\right)^{-1}$$

$$= \left(\frac{1}{24}\right)^{-1} = 24$$

Question 2.

Solution:

(c)

$$\because (5^{-1}\times 3^{-1})^{-1} = \left(\frac{1}{5}\times\frac{1}{3}\right)^{-1} = \left(\frac{1}{15}\right)^{-1} = 15$$

Question 3.

Solution:

(c)

$$\because (2^{-1}-4^{-1})^{2} = \left(\frac{1}{2}-\frac{1}{4}\right)^{2} = \left(\frac{2-1}{4}\right)^{2}$$

$$= \left(\frac{1}{4}\right)^{2} = \frac{1}{4}\times\frac{1}{4} = \frac{1}{16}$$

Question 4.

Solution:

(b)

$$\left(\frac{1}{2}\right)^{-2}+\left(\frac{1}{3}\right)^{-2}+\left(\frac{1}{4}\right)^{-2}$$
$$=(2)^2+(3)^2+(4)^2=4+9+16=29$$

Question 5.

Solution:

(c)

$$\left\{6^{-1}+\left(\frac{3}{2}\right)^{-1}\right\}^{-1}=\left[\left(\frac{1}{6}\right)+\left(\frac{2}{3}\right)\right]^{-1}$$
$$=\left(\frac{1+4}{6}\right)^{-1}=\left(\frac{5}{6}\right)^{-1}=\frac{6}{5}$$

Question 6.

Solution:

(b)

$$\because \quad \left(\frac{-1}{2}\right)^{-6}=(-2)^6$$
$$=(-2)\times(-2)\times(-2)\times(-2)\times(-2)\times(-2)$$
$$=64$$

Question 7.

Solution:

(b)

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

$$=\left(\frac{4-12}{3}\right)^{-1}=\left(\frac{-8}{3}\right)^{-1}=\frac{-3}{8}$$

Question 8.

Solution:

(a)

$$\because \quad \left[\left\{\left(-\frac{1}{2}\right)^{2}\right\}^{-2}\right]^{-1}=\left(\frac{-1}{2}\right)^{2\times(-2)\times(-1)}$$

$$=\left(\frac{-1}{2}\right)^{4}=\left(\frac{-1}{2}\right)\left(\frac{-1}{2}\right)\left(\frac{-1}{2}\right)\left(\frac{-1}{2}\right)$$

$$=\frac{1}{16}$$

Question 9.

Solution:

(c)

$$\because \quad \left(\frac{5}{6}\right)^{0}=1 \quad \left\{\because \left(\frac{a}{b}\right)^{0}=1\right\}$$

Question 10.

Solution:

(b)

$$\because \left(\frac{2}{3}\right)^{-5} = \left(\frac{3}{2}\right)^{5} = \frac{3}{2}\times\frac{3}{2}\times\frac{3}{2}\times\frac{3}{2}\times\frac{3}{2} = \frac{243}{32}$$

Question 11.

Solution:

(b)

$$\because \quad \left\{\left(\frac{1}{3}\right)^{2}\right\}^{4} = \left(\frac{1}{3}\right)^{2\times4} = \left(\frac{1}{3}\right)^{8}$$

Question 12.

Solution:

(b)

$$\because \left(\frac{-3}{2}\right)^{-1} = \left(\frac{2}{-3}\right)^{1} = \frac{2\times(-1)}{-3\times(-1)} = \frac{-2}{3}$$

Question 13.

Solution:

(d)

$$\because \quad (3^2 - 2^2)\times\left(\frac{2}{3}\right)^{-3} = (9-4)\left(\frac{3}{2}\right)^{3}$$

$$= 5\times\frac{3}{2}\times\frac{3}{2}\times\frac{3}{2} = \frac{135}{8}$$

Question 14.

Solution:

(a)

$$\because \quad \left\{\left(\frac{1}{3}\right)^{-3}-\left(\frac{1}{2}\right)^{-3}\right\} \div\left(\frac{1}{4}\right)^{-3}$$

$$=[(3)^3-(2)^3] \div(4)^3=(27-8) \div 64$$

$$=19 \div 64=\frac{19}{64}$$

Question 15.

Solution:

(c)

Question 16.

Solution:

(a)

$$\because\left(\frac{-2}{5}\right)^7 \div\left(\frac{-2}{5}\right)^5=\left(\frac{-2}{5}\right)^{7-5}=\left(\frac{-2}{5}\right)^2$$

$$=\frac{-2}{5} \times \frac{-2}{5}=\frac{4}{25}$$

Question 17.

Solution:

(c)

$$\because\left(\frac{-2}{3}\right)^2=\frac{-2}{3} \times \frac{-2}{3}=\frac{4}{9}$$

Question 18.

Solution:

(b)

$$\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)\times\left(\frac{-1}{2}\right)=\frac{-1}{8}$$

Question 19.

Solution:

(c)

$$\because \left(\frac{5}{3}\right)^{-5}\times\left(\frac{5}{3}\right)^{11}=\left(\frac{5}{3}\right)^{8x}$$

$$\Rightarrow \left(\frac{5}{3}\right)^{-5+11}=\left(\frac{5}{3}\right)^{8x}$$

$$\Rightarrow \left(\frac{5}{3}\right)^{6}=\left(\frac{5}{3}\right)^{8x}$$

Comparing $8x = 6$

$$\Rightarrow x=\frac{6}{8}=\frac{3}{4}$$

Question 20.

Solution:

(c)

Required number = $10^{-1} \div (-8)^{-1}$

$$=\frac{1}{10}\div\left(\frac{1}{-8}\right)=\frac{1}{10}\times\frac{-8}{1}=\frac{-4}{5}$$

Question 21.

Solution:

(c)

The number which is in standard form is 2.156×10^6

RS Aggarwal Class 7 Solutions

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