



## MATHS

### BOOKS - RS AGGARWAL MATHS (HINGLISH)

#### EXPONENTS

##### Solved Examples

1. Evaluate:

$$(i) 5^{-3} \quad (ii) \left(\frac{1}{3}\right)^{-4} \quad (iii) \left(\frac{5}{2}\right)^{-3} \quad (iv) (-2)^{-5} \quad (v) \left(\frac{-3}{4}\right)^{-4}$$

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2. Evaluate:

$$(i) \left(\frac{2}{3}\right)^3 \times \left(\frac{2}{3}\right)^2 \quad (ii) \left(\frac{4}{7}\right)^7 \times \left(\frac{4}{7}\right)^{-3} \quad (iii) \left(\frac{3}{2}\right)^{-3} \quad (iv) \left(\frac{8}{5}\right)^{-2}$$

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3. Evaluate  $\left(\frac{3}{8}\right)^{-2} \times \left(\frac{4}{5}\right)^{-3}$ .

A.  $\frac{121}{9}$

B.  $\frac{125}{9}$

C.  $\frac{155}{9}$

D.  $\frac{15}{9}$

**Answer: B**

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4. Evaluate  $\left(\frac{-2}{7}\right)^{-4} \times \left(\frac{-5}{7}\right)^2$ .

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



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6. Evaluate  $\left\{ \left( \frac{-3}{2} \right)^2 \right\}^{-3}$ .



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7. Simplify:

(i)  $(2^{-1} \times 5^{-1})^{-1} \div 4^{-1}$

(ii)  $(4^{-1} + 8^{-1}) \div \left( \frac{2}{3} \right)^{-1}$

A. 40,  $\frac{1}{4}$

B. 50,  $\frac{1}{5}$

C. 45,  $\frac{3}{4}$

D. 48,  $\frac{1}{8}$

Answer: A



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8. Simplify  $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$

A. 29

B. 39

C. 49

D. 19

**Answer: A**



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9. By what number should  $\left(\frac{1}{2}\right)^{-1}$  be multiplied so that the product is  $\left(\frac{-5}{4}\right)^{-1}$  ?

A.  $\left(\frac{-5}{4}\right)$

B.  $\left(\frac{-2}{5}\right)$

C.  $\left(\frac{4}{5}\right)$

D.  $\left(\frac{-1}{4}\right)$

**Answer: B**



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10. By what number should  $\left(\frac{-3}{2}\right)^{-3}$  be divided so that the quotient is  $\left(\frac{9}{4}\right)^{-2}$  ?

A.  $\frac{-3}{2}$

B.  $\frac{3}{2}$

C.  $\frac{-2}{3}$

D.  $\frac{2}{3}$

**Answer: A**



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11. Express each of the following numbers in standard form:

(i) 6872      (ii) 140000      (iii) 15360000000

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12. The diameter of the sun is  $(1.4 \times 10^9)$  m and the diameter of the earth is  $(1.2756 \times 10^7)$  m. Show that the diameter of the sun is nearly 100 times the diameter of the earth.

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13. In a stack there are 4 books each of thickness 24 mm and 6 paper sheets each of thickness 0.015 mm. What is the total thickness of the stack in standard form ?

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14. The distance between the sun and the Earth is  $1.496 \times 10^8$  km and distance between the Earth and the Moon is  $3.84 \times 10^8$  m. During solar eclipse the Moon comes in between the Earth and the sun. What is the distance between the Moon and the sun at that particular time?

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15. Write each of the following numbers in usual form:

(i)  $4.61 \times 10^5$     (ii)  $2.514 \times 10^7$     (iii)  $2.0001 \times 10^8$

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16. Express each of the following numbers in standard form:

(i) 0.00002    (ii) 0.000000061    (iii) 0.00000000837

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17. The size of a red blood cell is  $0.000007\text{ m}$  and the size of a plant cell is  $0.00001275\text{ m}$ . Compare these two

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18. Express the following numbers in usual form:

(i)  $2 \times 10^{-5}$

(ii)  $6.32 \times 10^{-4}$

(iii)  $1.596 \times 10^{-5}$

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## Exercise 2 A

1. Evaluate:

(i)  $4^{-3}$

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



$$\text{(iii)} \left(\frac{4}{3}\right)^{-3}$$

$$\text{(iv)} (-3)^4$$

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



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**2. Evaluate:**

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

$$\text{(ii)} \left(\frac{5}{6}\right)^6 \times \left(\frac{5}{6}\right)^{-4}$$

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

$$\text{(iv)} \left(\frac{9}{8}\right)^{-3} \times \left(\frac{9}{8}\right)^2$$



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**3. Evaluate:**

$$\text{(i)} \left(\frac{5}{9}\right)^{-2} \times \left(\frac{3}{5}\right)^{-3} \times \left(\frac{3}{5}\right)^0$$

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

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



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4. Evaluate:

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

$$(ii) \left[ \left\{ \left( \frac{-1}{3} \right)^2 \right\}^{-2} \right]^{-1}$$

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



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$$5. \text{ Evaluate } \left\{ \left( \frac{1}{3} \right)^{-3} - \left( \frac{1}{2} \right)^{-3} \right\} \div \left( \frac{1}{4} \right)^{-3}$$



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6. Evaluate  $\left\{ \left( \frac{4}{3} \right)^{-1} - \left( \frac{1}{4} \right)^{-1} \right\}^{-1}$



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7. Evaluate  $\left[ (5^{-1} \times 3^{-1})^{-1} \div 6^{-1} \right]$



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8. Find the value of:

(i)  $(2^0 + 3^{-1}) \times 3^2$

(ii)  $(2^{-1} \times 3^{-1}) \div 2^{-3}$

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



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9. Find the value of x for which  $\left( \frac{5}{3} \right)^{-4} \times \left( \frac{5}{3} \right)^{-5} = \left( \frac{5}{3} \right)^{3x}$



10. Find the value of  $x$  for which  $\left(\frac{4}{9}\right)^4 \times \left(\frac{4}{9}\right)^{-7} = \left(\frac{4}{9}\right)^{2x-1}$

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11. By what number should  $(-6)^{-1}$  be multiplied so that the product becomes  $9^{-1}$  ?

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12. By what number should  $\left(\frac{-2}{3}\right)^{-3}$  be divided so that the quotient may be  $\left(\frac{4}{27}\right)^{-2}$  ?

A.  $\left(\frac{-1}{27}\right)$

B.  $\left(\frac{-2}{27}\right)$

C.  $\left(\frac{2}{27}\right)$

D.  $\left(\frac{1}{27}\right)$

**Answer: B**



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13. If  $5^{2x+1} \div 25 = 125$ , find the value of  $x$ .

A. 6

B. 4

C. 2

D. -2

**Answer: C**



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1. Write each of the following numbers in standard form:

(i) 57.36    (ii) 3500000    (iii) 273000

(iv) 168000000    (v) 4630000000000    (vi)  $345 \times 10^5$



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2. Write each of the following numbers in usual form:

(i)  $3.74 \times 10^5$     (ii)  $6.912 \times 10^8$     (iii)  $4.1253 \times 10^7$

(iv)  $2.5 \times 10^4$     (v)  $5.17 \times 10^6$     (vi)  $1.679 \times 10^9$



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3. (i) The height of Mount Everest is 8848m. Write it in standard form.

(ii) The speed of light is 300000000m/sec. Express it in standard form.

(iii) The distance from the earth to the sun is 149600000000m. Write it in standard form.



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4. Mass of earth is  $(5.97 \times 10^{24})$  kg and mass of moon is  $(7.35 \times 10^{22})$  kg. What is the total mass of the two ?

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5. Write each of the following numbers in standard form:

(i) 0.0006    (ii) 0.00000083    (iii) 0.0000000534

(iv) 0.0027    (v) 0.00000165    (vi) 0.00000000689

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6. (i) 1 micron =  $\frac{1}{1000000}m$ . Express it in standard form.

(ii) Size of a bacteria =  $0.0000004m$ . Express it in standard form.

(iii) Thickness of a paper =  $0.03mm$ . Express it in standard form.

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7. Write each of the following numbers in usual form:

(i)  $2.06 \times 10^{-5}$     (ii)  $5 \times 10^{-7}$     (iii)  $6.82 \times 10^{-6}$

(iv)  $5.673 \times 10^{-4}$     (v)  $1.8 \times 10^{-2}$     (vi)  $4.129 \times 10^{-3}$



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## Exercise 2 C

1. The value of  $\left(\frac{2}{5}\right)^{-3}$  is

A.  $-\frac{8}{125}$

B.  $\frac{25}{4}$

C.  $\frac{125}{8}$

D.  $-\frac{2}{5}$

Answer: C



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2. The value of  $(-3)^{-4}$  is

A. 12

B. 81

C.  $-\frac{1}{12}$

D.  $\frac{1}{81}$

**Answer: D**



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3. The value of  $(-2)^{-5}$  is

A.  $-32$

B.  $\frac{-1}{32}$

C. 32

D.  $\frac{1}{32}$

**Answer:**



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4.  $(2^{-5} \div 2^{-2}) = ?$

A.  $\frac{1}{128}$

B.  $\frac{-1}{128}$

C.  $-\frac{1}{8}$

D.  $\frac{1}{8}$

**Answer: D**



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5. The value of  $(3^{-1} + 4^{-1})^{-1} \div 5^{-1}$  is

A.  $\frac{7}{10}$

B.  $\frac{60}{7}$

C.  $\frac{7}{5}$

D.  $\frac{7}{15}$

**Answer: B**



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6.  $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2} = ?$

A.  $\frac{61}{144}$

B.  $\frac{144}{61}$

C. 29

D.  $\frac{1}{29}$

**Answer: C**



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$$7. \left\{ \left( \frac{1}{3} \right)^{-3} - \left( \frac{1}{2} \right)^{-3} \right\} \div \left( \frac{1}{4} \right)^{-3} = ?$$

A.  $\frac{19}{64}$

B.  $\frac{27}{16}$

C.  $\frac{64}{19}$

D.  $\frac{16}{25}$

**Answer: A**



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$$8. \left[ \left\{ \left( -\frac{1}{2} \right)^2 \right\}^{-2} \right]^{-1} = ?$$

A.  $\frac{1}{16}$

B. 16

C.  $-\frac{1}{16}$

D. -18

**Answer: A**



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9. The value of  $x$  for which  $\left(\frac{7}{12}\right)^{-4} \times \left(\frac{7}{12}\right)^{3x} = \left(\frac{7}{12}\right)^5$  is

A.  $-1$

B.  $1$

C.  $2$

D.  $3$

**Answer: D**



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10. If  $(2^{3x-1} + 10) \div 7 = 6$ , then  $x$  is equal to

A.  $-2$

B. 0

C. 1

D. 2

**Answer: D**

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11.  $\left(\frac{2}{3}\right)^0 = ?$

A.  $\frac{3}{2}$

B.  $\frac{2}{3}$

C. 1

D. 0

**Answer: C**

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12.  $\left(\frac{-5}{3}\right)^{-1} = ?$

A.  $\frac{5}{3}$

B.  $\frac{3}{5}$

C.  $\frac{-3}{5}$

D. none of these

**Answer:**



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13.  $\left(-\frac{1}{2}\right)^3 = ?$

A.  $\frac{-1}{6}$

B.  $\frac{1}{6}$

C.  $\frac{1}{8}$

D.  $\frac{-1}{8}$

**Answer: D**

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14.  $\left(\frac{-3}{4}\right)^2 = ?$

A.  $\frac{-9}{16}$

B.  $\frac{9}{16}$

C.  $\frac{16}{9}$

D.  $\frac{-16}{9}$

**Answer:**

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15. 3670000 in standard form is

A.  $367 \times 10^4$



B.  $36.7 \times 10^5$

C.  $3.67 \times 10^6$

D. none of these

**Answer: C**



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**16.** 0.0000463 in standard form is

A.  $463 \times 10^{-7}$

B.  $4.63 \times 10^{-5}$

C.  $4.63 \times 10^{-9}$

D.  $46.3 \times 10^{-6}$

**Answer: B**



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17.  $0.000367 \times 10^4$  in usual form is

A. 3.67

B. 36.7

C. 0.367

D. 0.0367

**Answer: A**



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## Test Paper 2

1. Evaluate:

(i)  $3^{-4}$

(ii)  $(-4)^3$

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

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

(v)  $\left(\frac{5}{7}\right)^0$



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2. Evaluate  $\left\{ \left( \frac{-2}{3} \right)^3 \right\}^{-2}$

A.  $\frac{729}{64}$

B.  $\frac{739}{64}$

C.  $\frac{729}{84}$

D.  $-\frac{729}{64}$

**Answer: A**



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3. Simplify:  $\{3^{-1} + 6^{-1}\} \left( \frac{3}{4} \right)^{-1}$ .



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4. By what number should  $\left( \frac{-2}{3} \right)^{-2}$  be divided so that the quotient is  $\left( \frac{4}{9} \right)^{-2}$  ?

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5. By what number should  $(-3)^{-1}$  be multiplied so that the product becomes  $6^{-1}$  ?

A.  $\frac{1}{2}$

B.  $\frac{2}{3}$

C.  $\frac{-1}{2}$

D.  $\frac{-2}{3}$

**Answer: C**

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6. Express each of the following in standard form:

(i) 345    (ii) 180000    (iii) 0.000003    (iv) 0.000027

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7. The value of  $(-3)^{-3}$  is

A.  $-27$

B.  $9$

C.  $\frac{-1}{27}$

D.  $\frac{1}{27}$

**Answer: C**



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8. The value of  $\left(\frac{3}{4}\right)^{-3}$  is

A.  $\frac{-27}{64}$

B.  $\frac{64}{27}$

C.  $\frac{-9}{4}$

D.  $\frac{27}{64}$

**Answer: B**



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9.  $(3^{-6} \times 3^4) = ?$

A.  $3^{-2}$

B.  $3^2$

C.  $3^{-10}$

D.  $3^{10}$

**Answer: A**



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10. If  $\left(\frac{5}{12}\right)^{-4} \times \left(\frac{5}{12}\right)^{3x} = \left(\frac{5}{12}\right)^5$ , then  $x = ?$

A.  $-1$

B. 1

C. 2

D. 3

**Answer: D**



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11.  $\left(\frac{3}{5}\right)^0 = ?$

A.  $\frac{5}{3}$

B.  $\frac{3}{5}$

C. 1

D. 0

**Answer: C**



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12.  $\left(\frac{-6}{5}\right)^{-1} = ?$

A.  $\frac{6}{5}$

B.  $\frac{-6}{5}$

C.  $\frac{5}{6}$

D.  $\frac{-5}{6}$

**Answer: D**



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13.  $\left(\frac{-1}{3}\right)^3 = ?$

A.  $\frac{-1}{9}$

B.  $\frac{1}{9}$

C.  $\frac{-1}{27}$

D.  $\frac{1}{27}$



**Answer:**



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**14. Fill in the blanks**

360000 written in standard form is .....

A.  $3.6 \times 10^5$

B.  $36 \times 10^5$

C.  $3.6 \times 10^6$

D. none of these

**Answer: A**



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**15. Fill in the blanks**

0.0000123 written in standard form is .....

A.  $123 \times 10^{-7}$

B.  $1.23 \times 10^{-5}$

C.  $12.3 \times 10^{-6}$

D.  $1.23 \times 10^5$

**Answer: B**

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**16. Fill in the blanks**

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

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**17. Fill in the blanks**

$3 \times 10^{-3}$  in usual form is  $\dots\dots\dots$

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18.  $5.32 \times 10^{-4}$  in usual form is

A. 0.000532

B. 0.0532

C. 0.0000532

D. 5320000

**Answer: A**



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