



MATHS

BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

NUMBER SYSTEMS

Part A

1. If $x=2$ and $y=4$, then $\left(\frac{x}{y}\right)^{x-y} + \left(\frac{y}{x}\right)^{y-x} = \underline{\hspace{2cm}}$.

A. 4

B. 8

C. 12

D. 2

Answer:



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2. Which of the following is the greatest?

A. 4^2

B. $(16)^{3/2}$

C. $\left(\frac{1}{64}\right)^{-1/3}$

D. $(256)^{1/4}$

Answer: A::B::C



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3.
$$\frac{(32)^{0.2} + (81)^{0.25}}{(256)^{0.5} - (121)^{0.5}}$$

A. 2

B. 5

C. 1

D. 11

Answer: A



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4. $\frac{3}{7}$ lies between the fractions _____.

A. $\frac{4}{9}, \frac{5}{9}$

B. $\frac{43}{99}, \frac{4}{9}$

C. $\frac{42}{99}, \frac{4}{9}$

D. $\frac{41}{99}, \frac{41}{9}$

Answer: B::D



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5. The number 0.318564318564318564... is: (a) natural number
(b) an integer (C) rational number (d) an irrational number

A. a natural number

B. an integer

C. a rational number

D. an irrational number

Answer: A::B

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6. The number 0.7 in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is

A. $\frac{77}{100}$

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

C. $\frac{7}{9}$

D. $\frac{7}{100}$

Answer:

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7. The value of $\overline{23} + 0.\overline{22}$ is

A. 0.45

B. $0.\overline{45}$

C. $\frac{45}{99}$

D. both (b) and c

Answer: A::B::C::D



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8. The value of $\left[3 - 4(3 - 4)^4\right]^3$ is

A. 1

B. -1

C. 0

D. 7

Answer: A



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9. The cube root of 125 divided by square root of 25, is

A. 5

B. 1

C. 43835

D. None of these

Answer: A



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10. if $y^2 = 625$ then y is

- A. a rational number
- B. an irrational number
- C. neither rational nor irrational
- D. a natural number

Answer: A::B



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11. $\sqrt[2]{(81)^{2.5}} = \text{-----}$

- A. 29587
- B. 81
- C. 243
- D. 343

Answer: B::C::D



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12. Find the value of x , if $5^{x-3} \cdot 3^{2x-8} = 225$

A. 2

B. 3

C. 5

D. 7

Answer:



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13. If $x = 2 + \sqrt{3}$, find the value of $x + \frac{1}{x}$

A. $2 + \sqrt{3}$

B. $2 - \sqrt{3}$

C. $\sqrt{3} - 2$

D. 1

Answer: B::C



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14. The smallest natural number is 0 (b) 1 (c) -1 (d) None of these

A. -1

B. 0

C. 1

D. 2

Answer: A



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15. Which of the following is not a rational number?

A. $\sqrt{2}$

B. $\sqrt{4}$

C. $\sqrt{9}$

D. $\sqrt{25}$

Answer: B



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16. choose the wrong statement:

- A. Every natural number is a whole number.
- B. Every integer is a rational number
- C. Every rational number is an integer.
- D. Every rational number is a real number.

Answer: A::B



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17. The decimal expansion of the number $\sqrt{3}$ is

- A. a finite decimal
- B. 1.732
- C. non-terminating

D. non-terminating, non-recurring

Answer: A::C



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18. Between tw rational numbers

A. there is no rational number.

B. there is exactly one rational number.

C. there are infinitely many rational numbers.

D. there are only rational numbers and no irrational number

Answer: A::B



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19. Which of the following is an irrational number?

A. $\sqrt{\frac{4}{9}}$

B. $\frac{\sqrt{12}}{\sqrt{3}}$

C. $\sqrt{7}$

D. $\sqrt{8.1}$

Answer:



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20. Every rational number is

A. a natural number

B. an integer

C. a real number

D. a whole number

Answer: A::B



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21. $\sqrt{6} \times \sqrt{8}$ is equal to

A. $3\sqrt{4}$

B. $4\sqrt{3}$

C. $\sqrt{14}$

D. $6\sqrt{8}$

Answer: C::D



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22. After rationalising the denominator of $\frac{3\sqrt{2}}{3\sqrt{2} - 2\sqrt{2}}$, we get the denominator as

A. 1

B. 5

C. 19

D. 35

Answer: A



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23. Which of the following is equal to 'a'?

A. $a^{\frac{10}{6}} - a^{\frac{4}{6}}$

B. $.^{12}\sqrt{(a^4)^{1/3}}$

C. $\left(\sqrt{a^3}\right)^{\frac{2}{3}}$

D. $a^{\frac{12}{7}} \times a^{\frac{7}{12}}$

Answer: B::C



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24. The product of any two irrational numbers is

- A. always an irrational number.
- B. always a rational number
- C. always an integer.
- D. sometimes rational, sometimes irrational

Answer: A



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25. A rational number between $\sqrt{2}$ and $\sqrt{3}$ is

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

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

C. 1.5

D. 1.8

Answer: A



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Part B

1. The sum/difference of a rational and an irrational number is

_____ .



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2. The sum/difference of a rational and an irrational number is

_____ .



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3. The decimal expansion of every rational number is either

_____ or non-terminating _____



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4. The decimal representation of an irrational number is



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5. Write three numbers whose decimal expansions are non-terminating non-recurring.



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6. Between two rational numbers



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7. Between two rational numbers



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8. Between two distinct irrational numbers there lie _____ rational numbers.



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9. Reciprocal of a non - zero rational number



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Part C

1. State whether the following statements are true or false. Give reasons for your answers. (i) Every natural number is a whole number. (ii) Every integer is a whole number. (iii) Every rational number is a whole number.



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2. Every integer can be written in the form $\frac{p}{q}$, where p, q are integers $q \neq 0$

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3. State whether the following statements are true or false. Justify your answers, (i) Every irrational number is a real number. (ii) Every point on the number line is of the form \sqrt{m} , where m is a natural number. (iii) Every real number is a

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4. There are infinitely many integers between any two integers

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5. The square of an irrational number is always a rational number



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6. Reciprocal of every rational number is a rational number.



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7. Write first five whole numbers in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$



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8. Find decimal expansion of $\frac{17}{8}$, $\frac{3}{15}$, $\frac{2}{7}$, $\frac{50}{3}$.

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9. Find four rational numbers between $\frac{2}{9}$ and $\frac{3}{7}$.

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10. Find decimal form of $\sqrt{23}$ and $\sqrt{24}$ upto 3 decimal place.

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11. Find two irrational numbers lying between $\sqrt{2}$ and $\sqrt{3}$

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12. Find one irrational and one rational number between 2 and $\sqrt{5}$

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13. Write two numbers whose decimal expansions are terminating.

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14. What can be the maximum number of digits in the repeating block of digits in the expansion of $\frac{5}{7}$?

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15. Write three numbers whose decimal expansions are non-terminating non-recurring.



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16. Find the value of $(256)^{0.16} \times (256)^{0.09}$



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17. Find two irrational numbers between 2016 and 2017



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18. Represent $\frac{-7}{5}$ on the number line.



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19. Represent following on number line

(i) $\sqrt{5}$ (ii) $\sqrt{3}$ (iii) $\sqrt{2}$



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20. Insert two irrational numbers between $\frac{2}{3}$ and $\frac{3}{2}$



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21. Simplify:
$$\frac{\sqrt{5} + \sqrt{3}}{\sqrt{80} + \sqrt{48} - \sqrt{45} - \sqrt{27}}$$



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22. Find the value of $[1^3 + 2^3 + 3^3 + 8^2]^{-\frac{5}{2}}$



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23. Find the value of x if $x^{1/2} = (36)^{0.5}$



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24. Find the value of x if $(\sqrt{3})^x = 3^7$



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25. If $2^{5x} \div 2^x = \sqrt[5]{32}$. Then find the value of x .



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26. Evaluate a^{x-y} , a^{Y-z} , a^{z-x}



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27. Simplify $12^{\frac{2}{5}} \cdot 5^{\frac{2}{5}}$



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28. Which of the following rational numbers will have terminating decimal expansion or a non-terminating repeating (recurring) decimal expansion

(i) $\frac{135}{50}$ (ii) $\frac{4}{11}$ (iii) $\frac{8}{7}$ (iv) $6\frac{3}{8}$

(v) $\frac{55}{9}$ (vi) $\frac{5^2 \times 3^3}{2 \times 5^3 \times 27}$ (vii) $\frac{51}{60}$



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29. Classify the following numbers as terminating decimal or non-terminating recurring decimal or non-terminating non-recurring decimal:

(i) 0.1666... (ii) 0.250 (iii) 1.01001000100001...

(iv) 0.27696 (v) 2.142857142857... (vi) 0.3

(vii) 0.2359872785.... (viii) 0.484848848... (ix) 2.502500250002....

(x) 4.123456789

Also classify these given numbers as Rational and irrational numbers.



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30. Classify the following numbers as rational or irrational number:

(i) $\sqrt{27}$ (ii) $\sqrt{36}$ (iii) $\sqrt{5} \times \sqrt{125}$ (iv) $2\sqrt{3}$

$$(v) \frac{7\sqrt{7}}{\sqrt{343}} \quad (vi) 2 + \sqrt{21} \quad (viii) 5 + 2\sqrt{23} - (\sqrt{25} + \sqrt{92})$$
$$(viii) \frac{22}{7} \quad (ix) \pi \quad (x) \sqrt[3]{37}$$



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31. Express the following numbers in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$. (i) 0.0875 (ii) 2.123456789 (iii) 0.181818.....
(iv) 0.437 (v) .651



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32. Do as directed:

(i) Add : $\sqrt{125 + 2\sqrt{27}}$ and $-5\sqrt{5} - \sqrt{3}$

(ii) Add: $\sqrt{7} - \sqrt{11}$ and $\sqrt{5} - \sqrt{11} + \sqrt{13}$

(iii) Multiply : $2\sqrt{2}$ by $5\sqrt{2}$

(iv) Multiply : $(-3 + \sqrt{5})$ by 3

(v) Divide : $7\sqrt{5}$ by $-14\sqrt{125}$

Divide : $7\sqrt{5}$ by $-14\sqrt{125}$

(vi) Divide : $2\sqrt{216} - 3\sqrt{27}$ by 3

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33. Simplify:

(i) $(2\sqrt{2} + 3\sqrt{3})(2\sqrt{2} - 3\sqrt{3})$ (ii) $(2\sqrt{8} - 3\sqrt{2})^2$

(iii) $(\sqrt{7} + \sqrt{6})^2$ (iv) $(6 - \sqrt{2})(2 + \sqrt{3})$

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34. Evaluate :

(i) $\frac{2^{38} + 2^{37} + 2^{36}}{2^{39} + 2^{38} + 2^{37}}$ (ii) $\left[\left(64^{\frac{1}{2}} \right)^{\frac{1}{6}} \right]^2$

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35. Find the values of a and b if $\frac{6}{3\sqrt{2} - 2\sqrt{3}} = a\sqrt{2} - b\sqrt{3}$

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36. $\left(5\left(8^{1/3} + 27^{1/3}\right)^3\right)^{1/4} =$

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37. Simplify : $\frac{(25)^{\frac{3}{2}}x(243)^{\frac{3}{5}}}{(16)^{\frac{5}{4}}x(8)^{\frac{4}{3}}}$ (ii) $\frac{16x2^{n+1} - 4x2^n}{16x2^{n+2} - 2x2^{n+2}}$

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38. If $5^{2x-1} - (25)^{x-1} = 2500$ then find x

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Part D

1. Express $0.6 + 0.\bar{7} + 0.\overline{47}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$

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2. Rationalise the denominator of $\frac{1}{\sqrt{3} + \sqrt{5} + \sqrt{7}}$

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3. Find the value of a and b if

$$\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} - \frac{7 - 3\sqrt{5}}{3 - \sqrt{3}} = a + b\sqrt{5}$$

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4. If $x = (3 - 2\sqrt{2})$, show that $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right) = \pm 2$

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5. If $xyz=1$ then show that

$$(1 + x + y^{-1})^{-1} + (1 + y + z^{-1})^{-1} + (1 + z + x^{-1})^{-1} = 1$$

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6. Find the value of x if

(i) $25^{2x-3} = 5^{2x+3}$ (ii) $(4)^{2x-1} - (16)^{x-1} = 384$

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7. Evaluate: $\frac{64^{\frac{a}{6}}}{4^a} \times \frac{2^{2a+1}}{2^{a-1}}$



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8. Show that:

$$\frac{1}{1 + x^{b-a} + x^{c-a}} + \frac{1}{1 + x^{a-b} + x^{c-b}} + \frac{1}{1 + x^{b-c} + x^{a-c}} = 1$$



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9. Simplify: $\left(\frac{x^a}{x^{-b}}\right)^{a-b} \times \left(\frac{x^b}{x^{-c}}\right)^{b-c} \times \left(\frac{x^c}{x^{-a}}\right)^{c-a}$



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10. Let

$$T = \frac{1}{3 - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} + 2}$$

then-



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11. If $a = \frac{\sqrt{7} - \sqrt{6}}{\sqrt{7} + \sqrt{6}}$ and $b = \frac{\sqrt{7} + \sqrt{6}}{\sqrt{7} - \sqrt{6}}$, then find the value of $a^2 + b^2 + ab$



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12.
$$\frac{2\sqrt{6}}{\sqrt{2} + \sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6} + \sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6} + \sqrt{2}}$$



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13. If $x = 9 - 4\sqrt{5}$ then , find the value of $\left[x^3 - \frac{1}{x^3} \right]$

A. $-2684\sqrt{5}$

B. $-2584\sqrt{5}$

C. $-2584\sqrt{6}$

D. $-2684\sqrt{6}$

Answer: B

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14. If $a = 1 + \sqrt{7}$, find the value of $-\frac{6}{a}$

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15. If $p = 5 - 2\sqrt{6}$ Find $p^2 + \frac{1}{p^2}$

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16. Express 0.3178 in the form of p/q where p and q are integers

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17. If $\sqrt{2} = 1.414$ then find the value of $\sqrt{8} + \sqrt{50} + \sqrt{72} + \sqrt{98}$

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18. Simplify: $\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$

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