TOPIC : Basic Math (Class 2)

- Addition
- Substraction
- Multiplication.
- Squares and Square root.
- Cubes and cube root
- Indicies.
- Mixed fraction.
- linear equation.

Q1)(38/65)×(255/144) ÷ (19/5) + (14/19) =
(a) 7/14(c) 1(b) 17/15(d) 8/15

Q2) $\sqrt{7921} \times \sqrt{5329} - (78)^2 - (19)^2 = \sqrt{x}$

(a) 2604 (b) 2704 (c) 2764 (d) 2844 (e) None of these

$\sqrt{7921} \times \sqrt{5329} - (78)^2 - (19)^2 = \sqrt{x}$

$= 89 \times 73 - 6084 - 361 = \sqrt{x}$

$\Rightarrow 6497 - 6084 - 361 = \sqrt{x}$

$\Rightarrow 413 - 361 = \sqrt{x}$

$\Rightarrow 52 = \sqrt{x} \Rightarrow x = (52)^2 = 2704$

Q3) 6466849 को वर्गमूल (square root) पत्ता लगाउनु

(A) 2643 (B) 2623 (C) 2743 (D) 2543

Square root by long division method.

$\sqrt{abcd}$, $\sqrt{abcde}$, $\sqrt{\quad}$

2		2543
+2	4 ↓	6466849.
45	246	
+5	225	
504	2168.	
+4	2016	
5083	15249.	
	15249	X

504 × 4 = 2016

41 × 1 42 × 2

501 × 1 = 501

5081

405 × 5 = 2025

346 × 6 = 2076

Q4) कुन संख्या सबै भन्दा सानो संख्या हो जो 6351 मा थप गरे एउटा पूर्णवर्ग (perfect square) पाइन्छ?

(A) 39 (B) 9 (C) 29 (D) 49

$80^2 = 6400$

$6351 + ? =$ Perfect square.

$6351 + 49 = 6400$

Q5) 1 - 1/2 -1/4 + 1/8 + 1/16 = ?

(A)5/16(B)9/16(C)11/16(D)7/16

$\frac{1^{\times 16}}{16} - \frac{1\times 8}{2\times 8} - \frac{1\times 4}{4\times 4} + \frac{1\times 2}{8\times 2} + \frac{1}{16}$

$= \frac{16 - 8 - 4 + 2 + 1}{16}$

$= \frac{7}{16}$

$\frac{1}{4} + \frac{1}{4}$

$\frac{1}{1} - \frac{1}{2} - \frac{1}{4} + \frac{1}{8} + \frac{1}{16}$

$= \frac{16 - (1\times 8) - (1\times 4) + (1\times 2) + (1\times 1}{16}$

$= \frac{16 - 8 - 4 + 2 + 1}{16}$ $= \frac{7}{16}$

Q6 $\left(\frac{\sqrt{625}}{11} \times \frac{14}{\sqrt{25}} \times \frac{44}{\sqrt{196}}\right) = ?$

(A) 20 (B) 40 (C) 50 (D) 30

$\frac{25^{5}}{11_{1}} \times \frac{14}{5_{1}} \times \frac{44^{4}}{14}$

$= 20.$

$[1 - 30.]$ $\frac{14}{196}$

Q7. $(17)^2 + 6 \times (13)^2 - 212 \times 6 = ?$

A. 11 B. 23 C. 49 D. 31

$= 289 + 6 \times 169 - 1272.$

$= 289 + 6 \times (170 - 1) - 1272.$

$= 289 + 1020 - 6 - 1272.$

$= 289 + 1014 - 1272.$

$= 1303 - 1272. = 31$

1014
289
1303
−1272
31

Q8. $\sqrt{784} \times \sqrt{6.25} + 252 - 186 = ?$ 136. 25

1→30

$28 \times \sqrt{\frac{625}{100}} + 252 - 186.$

$= 28 \times \frac{25}{10} + 252 - 186.$ (14. 25 · 10 21)

$= 322 - 186$

$= 136$

Q9. 170/34 × 78/3 + 742/14 -7/5

A. 147.6 B. 181.6 C. 215.5 D. 243.7

$$\frac{10}{\cancel{170}} \times \frac{13}{\cancel{78}} + \frac{53}{\cancel{742}} - \frac{7}{5}$$

$$\cancel{34}\ 2 \qquad \cancel{3}\ 1 \qquad 14\ 1$$

$$130 + 53 - \frac{7}{5} = \frac{183}{1} - \frac{7}{5}$$

5) 7 (1.4

5

20

183 − 1.4

= 181.6

Mixed Fraction

Q10. $2\frac{2}{3} + 4\frac{4}{3} + 6\frac{6}{3}$

$= 2 + \frac{2}{3} + 4 + \frac{4}{3} + 6 + \frac{6}{3}$.

$= 12 + \frac{2}{3} + \frac{4}{3} + \frac{6}{3}$

$= 12 + \frac{12}{3} = 16$.

** $\left[2\frac{2}{3} = 2 + \frac{2}{3} \right]$

$2\frac{2}{3} = \frac{8}{3}$.

$12 + \frac{2}{3} + \frac{4}{3} + \frac{6}{3}$

$3 + \frac{4}{3} = 3\frac{4}{3}$.

Q11. $3\frac{2}{4} + 6\frac{1}{3} - 7\frac{1}{4}$

4, 3

$= 2 + \frac{2}{4} + \frac{1}{3} - \frac{1}{4}$

$= 2 + \frac{(2\times3)+(1\times4)-(1\times3)}{12}$

$= 2 + \frac{7}{12}$

$= 2\frac{7}{12} = \frac{31}{12}$ Ans.

Q12. (7) $\frac{1}{14} - 8\frac{1}{14} - 2\frac{2}{28}$

$= 7 + \frac{1}{14} - 8 - \frac{1}{14} - 2 - \frac{2}{28}$ 14.

$-1-2=-3.$

$= 7 - 8 - 2 + \frac{1}{14} - \frac{1}{14} - \frac{1}{14}$

$= -\frac{3}{1} - \frac{1}{14}.$

$= \frac{-3\times14-1}{14}$ $= \frac{-42-1}{14} = -\frac{43}{14}.$

Q13. $8\frac{1}{6} - 7\frac{3}{2} + 1\frac{1}{7} + 2\frac{2}{8} = \frac{252}{84}$.

$4 + \frac{1}{6} - \frac{3}{2} + \frac{1}{7} + \frac{2}{8}$.

$= 4 + \frac{(1\times28) - (3\times84) + (1\times24) + (2\times21)}{168}$.

$= 4 + \frac{28 - 252 + 24 + 42}{168}$.

$= 4 + \left(\frac{-158}{168}\right) = 4 - \frac{158}{168} = \frac{672 - 158}{168} = \frac{514}{168}$

$\frac{252}{84}$.

2 | 6, 12, 7, 8.
2 | 3, 1, 7, 4

$28 \times 6 = 168$

6 | 168 | 28
12
48
-48
0

252
84
158

$168 \times 4 = 672$

$672 - 158 = 514$

INDICES ⟶

$14.125^{2/3} \times 625^{3/4}$

$= (5^3)^{2/3} \times (5^4)^{3/4}$.

$= 5^{3\times\frac{2}{3}} \times 5^{4\times\frac{3}{4}}$.

$= 5^2 \times 5^3$.

$= 5^{2+3} = 5^5 = 3125$.

$5\times5\times5\times5\times5$

$625 = 5^4$

$a^2 = a\times a$.

$3\ \ a\times a\times a$.

$\frac{1}{3^2} = 3^{-2}$.

$a^2 \times a^3 = a\times a\times a\times a\times a$

$= a^5$.

$a^{(m)}$ → Power.

base.

$3^2 \times 3^3 = 3^{3+2}$

$= 3^{33}$.

[(v) $\frac{1}{a^m} = a^{-m}$.

(vi) $(ab)^m = a^m b^m$.

[(i) $a^m \times a^n = a^{m+n}$.

(ii) $\frac{a^m}{a^n} = a^{m-n}$.

(iii) $(a^n)^m = a^{n\times m}$.

(iv) $\sqrt{a}\times\sqrt{b} = \sqrt{ab}$.

15. Simplify: $[5a^5b^2 \times 3(ab^3)^2]/(15a^2b)$.

(ab)

$$\frac{5a^5b^2 \times 3a^2b^6}{15a^2 \times b}$$

$$= \frac{a^{5+2} \times b^{2+6}}{a^2 \times b}$$

$$= \frac{a^7 \times b^8}{a^2 \times b^1}$$

$$= a^{7-2} \times b^{8-1}$$

$$= a^5 b^7$$

16) $[64 \times 128 \times 32 = 2^x]$ भने x कती हो?

A) 10 B) 11 C) 12 D) 13

$\Rightarrow 2^6 \times 64 \times 2 \times 32 = 2^n$.

$\Rightarrow 2^6 \times 6^1 2^6 \times 2^1 \times 2^5 = 2^n$.

$\Rightarrow 2^{6+6+1+5} = 2^n$.

$\Rightarrow (2)^{18} = (2)^n$.

$n = 18$.

$a^n = a^y$.

$[n = y]$.

$2 \mid 64 = 2^6$.

$2 \mid 32$

$2 \mid 16$

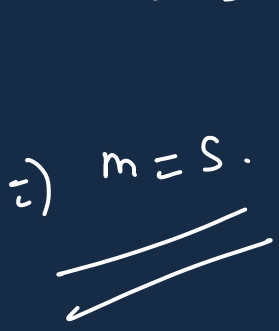
$2 \mid 8$

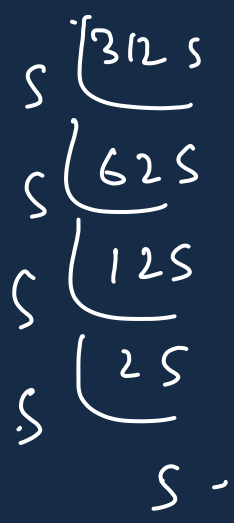
$2 \mid 4$

2.

17.यदी $5^m=3125$ भने m=?

A)4 B)5 C) 6 D)7





easy.

18. $\sqrt{277 + \sqrt[12]{136 + \sqrt{61 + \sqrt[3]{9}}}}$

$\sqrt{64} = 8$.

$\sqrt{144} = 12$.

$\sqrt{284} = 17$.

LINEAR EQUATIONS AND PROBLEMS

19) 3x + 1 = 10, भने x को मान कती हो?

$\hookrightarrow x = 3$.

$3x = 10 - 1$

$\Rightarrow 3x = 9$.

$\Rightarrow x = \frac{9}{3}$

$x = -\frac{1}{3}$ //

$a[x] + b = 0$.

$3x + 1 = 0$.

$[ax + b = 0]$.

$\frac{4}{x} + 1 = 0$.

$4y - 2 = 0$.

LHS RHS.

$4 = 4$. $4 = 4$.

$\Rightarrow 4 + 2 = 4 + 2$. $\Rightarrow 4 \times 2 = 4 \times 2$

$6 = 6$. $\Rightarrow \frac{8}{4} = \frac{8}{4}$.

we can add or substract same no to both side of eqn.

↳ we can multiply n divide with same no.

20) $4y - 21 = -171$, भने $y = ?$

sum.

[10 -15]

$\Rightarrow 4y - 21 = -171$.

$\Rightarrow 4y = -171 + 21$

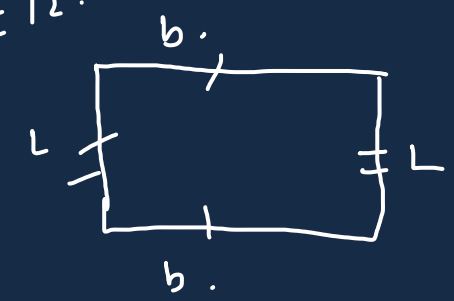
$\Rightarrow 4y = -150$.

$\Rightarrow y = \frac{-150}{42}$.

$y = \frac{-75}{2}$.

21)The length of a rectangle is twice its breadth. If the perimeter is 72 metre, find the length and breadth of the rectangle

$x = 12$.



$L + b + L + b$ = Perimeter.

$\Rightarrow 2L + 2b$ = Pe.

$\Rightarrow 2(l + b)$ = Perimeter.

breadth = x = 12.

length = $2x$ = 24.

Perimeter = 72

$\Rightarrow 2(2x + x) = 72$.

$\Rightarrow 2(3x) = 72$.

$\Rightarrow 6x = 72$.

$x = \frac{72}{6} 12$.

~~6~~ 1

22.कुनै रूपियाँको 1 भाग (part) बृद्धि 40 रूपियाँ हुन्छ भने, मोठ धनराशि कति थियो ?

(A) 37 रूपियाँ (B) 35 रूपियाँ (C) 25 रूपियाँ (D) 30 रूपियाँ

x.

$\left[\frac{x}{1} + \frac{1}{7}x = 40. \right]$.

$\left[\Rightarrow \frac{7x+x}{7} = 40 \right]$

$\left[\Rightarrow \frac{8x}{7} = 40 \right]$

$\left[x = \frac{40^{5} \times 7}{8_{1}} = 35. \right]$

23.कुनै त्रिभुजका (triangle) तीनवटा कोणहरू यथाक्रममा 3x°, (2x-7)° तथा (4x-11)° भएको खण्डमा x कति हुन्छ ?

(A) 20°(B) 22°(C) 18°(D) 23°

$x_1 + x_2 + x_3 = 180^\circ$.

$3x + (2x-7) + (4x-11) = 180^\circ$.

$9x = 180 + 18$.

$9x = 198$.

$x = \frac{198}{9} = 22$

$\Rightarrow 3x + 2x - 7 + 4x - 11 = 180^\circ$

$\Rightarrow 9x - 18 = 180^\circ$

24. $\frac{841}{2025}$ को बर्गमूल (square root) लाई कति दिएर गुणा (multiply) गरे, गुणफल (product) 1 हुन्छ?

(A) $\frac{55}{39}$ (B) $\frac{39}{45}$ (C) $\frac{45}{29}$ (D) $\frac{2025}{841}$

$1 \rightarrow 30$.

$\frac{a}{b} \times \frac{b}{a} = 1$

$\sqrt{20:25}$ $\quad \sqrt{\frac{841}{2025}} = \frac{\sqrt{841}}{\sqrt{2025}} = \frac{29}{45}$.

45

$4^2 = 16$

$\Rightarrow \frac{29}{45} \times \frac{45}{29} = 1$.

25. $\sqrt{5+\sqrt[4]{11+\sqrt[5]{19+\sqrt{29+\sqrt{49}}}}}$

$\sqrt{9}=3$, 16, 36, 7

(A) 2

(B) 1

(C) 6

(D) 3 ✓

26. Simplification:

$$\frac{b+c}{(a-b)(c-a)}+\frac{c+a}{(a-b)(b-c)}+\frac{a+b}{(c-a)(b-c)}=1.$$

$$=\frac{(b+c)(b-c)+(c+a)(c-a)+(a+b)(a-b)}{(a-b)(b-c)(c-a)}$$

$$a^2-b^2=(a+b)(a-b)$$

$$=\frac{b^2-c^2+c^2-a^2+a^2-b^2}{(a-b)(b-c)(c-a)}=\frac{0}{a}=0.$$

27. Simplify: $12 + 6 \times 27 \div 3 + 2 - 16 \div 8 \times 2$ BODMAS.

$= 12 + \frac{6 \times 27}{3} + 2 - \frac{16}{8} \times 2$ 11 64.

$= 12 + 54 + 2 - 4.$

$= 64.$

28. Evaluate:

$$[\{(125 \times \overline{33 \div 11} + 2) \times 34\} \div 493] \times \frac{1}{2}$$

$$= \left[\left\{\left(125 \times \frac{33}{11} + 2\right) \times 34\right\} \div 493\right] \times \frac{1}{2}$$

$$= \left[\{(375 + 2) \times 34\} \div 493\right] \times \frac{1}{2}$$

$$= \frac{375 \times 34}{493} \times \frac{1}{2} = 3$$

29. $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\cdots\cdots\left(1+\frac{1}{88}\right)=?$

(A) $44\cdot5$ (B) 45 (C) $\frac{82}{89}$ (D) 44

$\left(\frac{3}{2}\right)\left(\frac{4}{3}\right)\left(\frac{5}{4}\right)\left(\frac{6}{5}\right)\cdots\cdots\frac{89}{88}$

$= \frac{89}{2} = 44.5$

30. $\sqrt{(0.0169x)} = 13$ भयो भने x =?

(A) 100 (B) 10000 (C)100000 (D) 1000

$\Rightarrow \sqrt{0.0169\,x} = 13.$

$\Rightarrow \sqrt{\frac{169}{10000}\,x} = 13.$

$\Rightarrow \frac{13}{100}\sqrt{x} = 13.$

$\Rightarrow \sqrt{x} = \frac{13 \times 100}{13}$

$\sqrt{x} = 100$

$\Rightarrow x = (100)^2$

$= 10000$

31. निम्नलिखित समीकरणमा, x को स्थानमा के आउँछ?

$4x/\sqrt{128} = \sqrt{162}/4x$

(A) 1 (B) 3 (C) 4 (D) 2

$\frac{4x}{\sqrt{128}} = \frac{\sqrt{162}}{4x}$.

$16x^2 = 9 \times 16$

$x^2 = 9$

$x = \sqrt{9}$

$= 3$.

$\sqrt{a} \times \sqrt{b} = \sqrt{ab}$.

$4x \times 4x = \sqrt{162} \times \sqrt{128}$

$16x^2 = \sqrt{162 \times 128}$

$16x^2 = \sqrt{2 \times 9 \times 9 \times 2^7}$.

$16x^2 = \sqrt{9^2 \times 2^8} = (9^2 \times 2^8)^{1/2}$.

$= (9^2)^{1/2} \times 2^{8 \times \frac{1}{2}}$.

$= 9 \times 2^4$.

$= 9 \times 16$

$= 144$

$162 = 2 \times 9 \times 9$

$128 = 64 \times 2 = 2^7$.

$64 = 4 \times 4 \times 4$.

$= 2^2 \times 2^2 \times 2^2$

$= 2^6$.

32. ठूलोबाट क्रमिक रूपमा सानो पारेर सजाऊ :

(A) $\frac{7}{11}$ < (B) $\frac{16}{20}$ < (C) $\frac{21}{22}$ cba

$\frac{7}{11}$ = 0.63

$\frac{16}{20}$ = 0.8

$\frac{21}{22}$ = 0.9.

11) 70 (.63
66
40

20) 160 (.8
160

22) 210 (.9
198

21 60

22
× 9
198

33. √((2)^n) = 64 भए n=?

(A) 4 (B) 6 (C) 2 (D) 12

comp. [5-16]

Number system.

$\sqrt{2^n} = 64$.

$(2^n)^{1/2} = 64$.

$2^{n/2} = 64$

$2^{n/2} = 2^6$.

$\frac{n}{2} = 6$.

$n = 6 \times 2 = 12$.

$\sqrt{a} = a^{1/2}$.

Equation

$10 = 150$

$13 = 450 \rightarrow 600$