Simplification

Rule of VBODMAS

In simplification, we must follow the rule of 'VBODMAS' while going through the different mathematical operations given in single expression and the expansion of VBODMAS are as follow.

V → Vinculum or Bar Bracket ⇒ '‾'
B → Bracket ⇒( ), { }, [ ]
O → Of ⇒ x of y = y × x
D → Division ⇒'÷'
M → Multiplication ⇒ '×'
A → Addition ⇒ '+'
S → Subtraction ⇒ '–'

e.g. $18 + 16 \div 4 \text{ of } 2 - 2[2 + \{2 \times (3 \div \overline{4 - 2})\}]$

Step I In 'VBODMAS' first appears V (the line bracket), so we will solve the line bracket first.

i.e. $\overline{4 - 2} = 2$

Now, the equation appears as

$18 + 16 \div 4 \text{ of } 2 - 2[2 + \{2 \times (3 \div 2)\}]$

Step II Now, we remove the brackets but the equation contains all the three types of brackets. Hence, we first remove ( ), { } at second and [] finally.

$(3 \div 2) = (1.5)$

Now, equation appears as

$18 + 16 \div 4 \text{ of } 2 - 2[2 + \{2 \times 1.5\}]$

Again, $\{2 \times 1.5\} = \{3\}$

Now, equation appears as

$18 + 16 \div 4 \text{ of } 2 - 2[2 + 3]$

Again, $[2 + 3] = 5$

Hence, the equation reduces to

$18 + 16 \div 4 \text{ of } 2 - 2 \times 5$

Step III In VBODMAS, O is the third operation to be performed, i.e.

$4 \text{ of } 2 = 4 \times 2 = 8$

Now, the equation reduces to

$18 + 16 \div 8 - 2 \times 5$

Step IV Now, the fourth letter D defines the operation of division, i.e.

$16 \div 8 = 2$

Now, the equation reduces to

$18 + 2 - 2 \times 5$

Step V Now, the fifth letter M defines the operation of multiplication, i.e.

$2 \times 5 = 10$, equation reduces to $18 + 2 - 10$

Step VI Now, the sixth letter A defines the addition, i.e. $18 + 2 = 20$, equation reduces to $20 - 10$

Step VII Now, the seventh letter S defines the subtraction, i.e. $20 - 10 = 10$,

hence the answer is 10.

Helping Tips

- While simplifying the expression we must operate ‾, then ( ) thereafter { } and finally[ ]. The sequence of operating these bracket is of huge importance, so don't disobey the sequence of the brackets as well as VBODMAS.
- In 'VBODMAS' the operation O → of (×) and M → Multiplication, seems similar but the order of solving them must be according to the sequence of VBODMAS to find the correct result.
  i.e. solve (of) first, then Multiplication.

Example 1 Find the value of expression $2+2\times2-2\div2$ of 2.

(a) 5.5 (b) 6 (c) 7 (d) 5

Sol. *(a)* $2+2\times2-2\div2$ of $2=?$

$\Rightarrow \quad 2+2\times2-2\div4=?$

$\Rightarrow \quad 2+2\times2-\frac{2}{4}=?$

$\Rightarrow \quad 2+4-\frac{1}{2}=?$

$\Rightarrow \quad 6-\frac{1}{2}=? \quad \Rightarrow \quad ?=\frac{11}{2}=5.5$

Example 2 Simplify the expression $150-(19+11)\div2$ is

(a) 136 (b) 135 (c) 146 (d) 150

Sol. *(b)* $150-(19+11)\div2=150-30\div2$

$=150-15=135$

Example 3 $8500+(1600\div?)$ of $\frac{1}{5}=8501$, find the value of question (?) mark.

(a) 400 (b) 350

(c) 420 (d) 320

Sol. *(d)* $8500+\frac{1600}{?}\times\frac{1}{5}=8501$

$\Rightarrow \quad \frac{1600}{?}\times\frac{1}{5}=8501-8500$

$\Rightarrow \quad \frac{1600}{?}\times\frac{1}{5}=1 \Rightarrow \quad ?=\frac{1600}{5}$

$\Rightarrow \quad ?=320$

Example 4 The difference between the number and its three fifth is 40, what is the number?

(a) 80 (b) 100 (c) 90 (d) 120

Sol. *(b)* Let the number be x.

$\because \quad x-\frac{3}{5}x=40$

$\Rightarrow \quad \frac{5x-3x}{5}=40 \Rightarrow \frac{2x}{5}=40$

$\Rightarrow \quad x=\frac{40\times5}{2}$

$\therefore \quad x=100$

Practice Exercise

1. What is the value of expression $1111+111+11+11=?$

(a) 1156 (b) 1296 (c) 1225 (d) 1244

2. $9732-6212-3121=?$

(a) 399 (b) 400 (c) 339 (d) 299

3. Simplify the expression $8324+6321-9732$ is

(a) 4900 (b) 4913 (c) 4800 (d) 4500

4. Simplify the expression $2+2\div2+2\times2+2-2$ is

(a) 5 (b) 7 (c) 3 (d) 2

5. Find the value of question (?) mark.

$$15-2+4\div\frac{1}{2}\times8=?$$

(a) 77 (b) 86 (c) 64 (d) 67

6. Simplify the expression $\frac{7}{36}\div\frac{5}{12}\times\frac{25}{14}$ is

(a) $\frac{4}{5}$ (b) $\frac{6}{5}$ (c) $\frac{5}{4}$ (d) $\frac{5}{6}$

7. What is the value of expression $162\div18+9\times6=?$

(a) 63 (b) 65 (c) 67 (d) 66

8. Simplify the expression $8\div3+4\div2+5-6$ is

(a) $3\frac{1}{3}$ (b) $3\frac{2}{3}$ (c) $3\frac{2}{4}$ (d) $3\frac{5}{2}$

9. Simplify the expression $\frac{6}{5}\times\frac{3}{2}\div\frac{4}{8}-\frac{2}{3}+\frac{1}{5}$ is

(a) $1\frac{2}{15}$ (b) $\frac{48}{17}$ (c) $3\frac{2}{15}$ (d) $8\frac{7}{5}$

10. Simplify the expression $\frac{3}{8}\times\frac{4}{2}\times\frac{5}{3}\div\frac{15}{9}$ is

(a) $\frac{4}{5}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) $\frac{6}{5}$

11. Find the value of question (?) mark.

$$?\div25\div12=52.45$$

(a) 15735 (b) 15625

(c) 13824 (d) 14428

12. Simplify the expression
$6 \times 0.6 \times 0.06 \times 0.006 \times 60$ is
(a) 0.7566 (b) 0.07776
(c) 0.8976 (d) 0.7776

13. What is the value of expression
$[\{(6 \div 2) \times 3\} \times 2]$?
(a) 17 (b) 19
(c) 18 (d) 16

14. Find the value of question (?) mark.

$$10\frac{2}{5} \times 8\frac{4}{5} \div 4\frac{2}{5} = ?$$

(a) $22\frac{1}{5}$ (b) $20\frac{4}{5}$
(c) $20\frac{6}{5}$ (d) $21\frac{1}{5}$

15. Simplify the expression
$21 \times 7 + 25 \div 5 - 24 \times \frac{1}{8}$ is
(a) 151 (b) 147 (c) 150 (d) 149

16. The sum of twice of a number and thrice of 42 is 238. What will be the sum of thrice of that number and twice of 42?
(a) 245 (b) 250 (c) 264 (d) 252

17. Simplify the expression $\frac{(3+3+3+3) \div 3}{(5+5+5+5) \div 5}$ is
(a) 3 (b) 5 (c) 7 (d) 1

18. Find the value of question (?) mark.

$$35 - [23 - \{19 - (15 - ?)\}] = 12 \times 2 \div \frac{1}{2}$$

(a) 39 (b) 42 (c) 32 (d) 43

19. The sum of two number is 1100. If one number is 999 then find the other number.
(a) 210 (b) 111 (c) 101 (d) 211

20. Find the number which is subtracted from 986864 is equal to sum of the number 345362 and 453532
(a) 178970 (b) 187970 (c) 198770 (d) 187089

Answers

1	(d)	2	(a)	3	(b)	4	(b)	5	(a)	6	(d)	7	(a)	8	(b)	9	(c)	10	(c)
11	(a)	12	(b)	13	(c)	14	(b)	15	(d)	16	(d)	17	(d)	18	(c)	19	(c)	20	(b)

Hints & Solutions

1. $1111 + 111 + 11 + 11 = ? \Rightarrow 1244 = ?$

2. $9732 - 6212 - 3121 = ? \quad \Rightarrow \quad 9732 - 9333 = ?$
$\Rightarrow \quad ? = 399$

3. $8324 + 6321 - 9732 = ?$
$\Rightarrow \quad 14645 - 9732 = ?$
$\Rightarrow \quad 4913 = ?$

4. $2 + 2 \div 2 + 2 \times 2 + 2 - 2$

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

$$= 2 + 1 + 4 + 2 - 2 = 9 - 2 = 7$$

5. $15 - 2 + 4 \div \frac{1}{2} \times 8 = ?$

$\Rightarrow \quad ? = 15 - 2 + 4 \times 2 \times 8 \quad \Rightarrow ? = 15 - 2 + 64$
$\Rightarrow \quad ? = 77$

6. $\frac{7}{36} \div \frac{5}{12} \times \frac{25}{14} = \frac{7}{36} \times \frac{12}{5} \times \frac{25}{14} = \frac{5}{6}$

7. $162 \div 18 + 9 \times 6 = 162 \times \frac{1}{18} + 54 = 9 + 54 = 63$

8. $8 \div 3 + 4 \div 2 + 5 - 6 = \frac{8}{3} + 2 + 5 - 6$

$$= \frac{8}{3} + 7 - 6 = \frac{8}{3} + 1 = \frac{8+3}{3} = \frac{11}{3} = 3\frac{2}{3}$$

9. $\frac{6}{5} \times \frac{3}{2} \div \frac{4}{8} - \frac{2}{3} + \frac{1}{5} = ?$

$\Rightarrow \quad ? = \frac{6}{5} \times \frac{3}{2} \times \frac{8}{4} - \frac{2}{3} + \frac{1}{5} \Rightarrow ? = \frac{18}{5} - \frac{2}{3} + \frac{1}{5}$

$\Rightarrow \quad ? = \frac{54 - 10 + 3}{15} \Rightarrow ? = \frac{57 - 10}{15}$

$\Rightarrow \quad ? = \frac{47}{15} \Rightarrow ? = 3\frac{2}{15}$

10. $\frac{3}{8} \times \frac{4}{2} \times \frac{5}{3} \div \frac{15}{9} = ? \quad \Rightarrow \quad \frac{3}{8} \times \frac{4}{2} \times \frac{5}{3} \times \frac{9}{15} = ?$
$\Rightarrow ? = \frac{3}{8} \times \frac{2}{1} \times \frac{5}{3} \times \frac{9}{15} = \frac{3}{4}$

11. $\frac{?}{25 \times 12} = 52.45$
$\Rightarrow \quad ? = 52.45 \times 25 \times 12 \Rightarrow ? = 15735$

12. $6 \times \frac{6}{10} \times \frac{6}{100} \times \frac{6}{1000} \times 60 = ?$

$\Rightarrow \quad 6 \times \frac{6}{10} \times \frac{6}{100} \times \frac{6}{100} \times 6 = ?$

$\Rightarrow \quad \frac{7776}{100000} = ? \quad \Rightarrow \quad 0.07776 = ?$

13. $[\{(6 \div 2) \times 3\} \times 2] = [\{3 \times 3\} \times 2] = [9 \times 2] = 18$

14. $? = 10\frac{2}{5} \times 8\frac{4}{5} \div 4\frac{2}{5} = \frac{52}{5} \times \frac{44}{5} \div \frac{22}{5}$

$= \frac{52}{5} \times \frac{44}{5} \times \frac{5}{22} = \frac{52}{5} \times 2 = \frac{104}{5} = 20\frac{4}{5}$

15. $21 \times 7 + 25 \div 5 - 24 \times \frac{1}{8} = 147 + 25 \times \frac{1}{5} - 3$

$= 147 + 5 - 3 = 149$

16. Let the number be x

Then, $2 \times x + 3 \times 42 = 238$

$\Rightarrow \quad 2x = 238 - 126$

$\Rightarrow \quad 2x = 112 \Rightarrow x = 56$

$\therefore$ Required sum $= 3 \times 56 + 2 \times 42$

$= 168 + 84 = 252$

17. $? = \frac{(3 + 3 + 3 + 3) \div 3}{(5 + 5 + 5 + 5) \div 5} \Rightarrow ? = \frac{12 \div 3}{20 \div 5} = \frac{4}{4} = 1$

18. $35 - [23 - \{19 - (15 - ?)\}] = 12 \times 2 \div \frac{1}{2}$

$\Rightarrow \quad 35 - [23 - \{19 - 15 + ?\}] = 12 \times 2 \times 2$

$\Rightarrow \quad 35 - [23 - 4 - ?] = 48$

$\Rightarrow \quad 35 - 19 + ? = 48$

$\Rightarrow \quad 35 - 19 + ? = 48$

$\Rightarrow \quad ? = 48 - 16$

$\therefore \quad ? = 32$

19. Let second number be x.

According to the question,

$x + 999 = 1100$

$\Rightarrow \quad x = 1100 - 999 = 101$

$\therefore \quad x = 101$

20. Let the subtracted number be x.

Then, according to the question

$986864 - x = 345362 + 453532$

$x = 986864 - (345362 + 453532)$

$x = 986864 - 798894$

$x = 187970$

Try Yourself

1) $52000 \div 60 \times 30 = ? \times 40$

(a) 550 (b) 650 (c) 601 (d) 652

2) $377 \div 13 \div 29 \times \frac{1}{4} \div 2 = ?$

(a) $\frac{1}{5}$ (b) $\frac{1}{3}$ (c) $\frac{1}{7}$ (d) $\frac{1}{8}$

3) $8312 - 4352 - 3362 + 4529 = ?$

(a) 5127 (b) 5215

(c) 5642 (d) 5015

4) $222 \times 22 \times 2 = ?$

(a) 9568 (b) 7698 (c) 8768 (d) 9768

5) $\frac{250}{15} \times \frac{300}{20} \div \frac{150}{100} = ?$

(a) $\frac{500}{3}$ (b) $\frac{400}{3}$ (c) $\frac{502}{3}$ (d) $\frac{505}{3}$

6) The difference of first and second number is 1001. If first number is 1000. then find the other number.

(a) –1 (b) –2 (c) 1 (d) 3

7) $87 \times 101 = ?$

(a) 8781 (b) 8787

(c) 8750 (d) 8558

8) Find the number which is substracted from 9212 is equal to the sum of the number 5213 and 3120.

(a) 879 (b) 878

(c) 798 (d) 897

9) A boy read $\frac{2}{7}$ th of a book on one day and $\frac{4}{5}$ th of the remainder on another day. If there were 12 pages unread. How many pages in the book.

(a) 94 (b) 74

(c) 64 (d) 84

10) $23 \times 19 \times ? \div 19 \div 17 = 115$

(a) 85 (b) 65 (c) 95 (d) 83

Answers

1	*(b)*	2	*(d)*	3	*(a)*	4	*(d)*	5	*(a)*
6	*(a)*	7	*(b)*	8	*(a)*	9	*(d)*	10	*(a)*