

Properties of Equality: Applying the Associative, Commutative, and Distributive Laws

1 Are the following calculations correct?

1. $5 + 2 + 5 = 5 + 5 + 2 = 10 + 2 = 12$

2. $3 - 2 + 11 = 3 - 11 + 2 = -6$

3. $4 \times 10 \times 25 = 4 \times 25 \times 10 = 100 \times 10 = 1000$

4. $63 \div 7 \times (-9) = -63 \div 9 \times 7 = -7 \times 7 = -49$

2 $33 + 125 + 67 = \underline{\hspace{2cm}}.$

$49 + 86 + 51 = \underline{\hspace{2cm}}.$

$2 \times 37 \times 5 = \underline{\hspace{2cm}}.$

$4 \times 318 \times 25 = \underline{\hspace{2cm}}.$

3 Are the following calculations correct?

1. $13 + 8 + 97 = 100 + 8 = 108$

2. $19 + (-13) + (-9) = 19 + (-9) + (-13) = 10 - 13 = -3$

3. $5 \times (-111) \times (-2) = 5 \times 2 \times 111 = 10 \times 111 = 1110$

4. $25 \times 101 \times 4 = 25 \times 4 \times 101 = 1010$

4 $12 + 321 + 88 = \underline{\hspace{2cm}}.$

$73 + 606 + 27 = \underline{\hspace{2cm}}.$

$2 \times 425 \times 5 = \underline{\hspace{2cm}}.$

$4 \times 219 \times 25 = \underline{\hspace{2cm}}.$

5 Are the following calculations correct?

1. $(2 + 12) + 88 = 2 + (12 + 88) = 2 + 100 = 102$

2. $(100 - 6) - 4 = 100 - 6 - 4 = 100 - (6 + 4) = 100 - 10 = 90$

3. $(77 \times 2) \times 5 = 77 \times (2 \times 5) = 77 \times 10 = 770$

4. $(60 \div 2) \div 3 = 60 \div 2 \div 3 = 60 \div (2 \times 3) = 10$

6 $(7878 + 99) + 1 = \underline{\hspace{2cm}}$.

$(9970 - 999) - 1 = \underline{\hspace{2cm}}$.

$(2345 \times 5) \times 2 = \underline{\hspace{2cm}}$.

$(139 \times 25) \times 4 \div (-100) = \underline{\hspace{2cm}}$.

7 Are the following calculations correct?

1. $(2 + 7) + 3 = 2 + (7 + 3) = 2 + 10 = 12$

2. $(10 - 7) - 3 = 10 - (7 - 3) = 10 - 4 = 6$

3. $(3 \times 2) \times 5 = 3 \times (2 \times 5) = 3 \times 10 = 30$

4. $(40 \div 4) \div 2 = 40 \div (4 \div 2) = 40 \div 2 = 20$

8 $(123 + 999) + 1 = \underline{\hspace{2cm}}.$

$(848 - 99) - 1 = \underline{\hspace{2cm}}.$

$(2021 \times 25) \times 4 = \underline{\hspace{2cm}}.$

$(168 \times 2) \times 5 \div (-10) = \underline{\hspace{2cm}}.$

9 Which of the following expressions is correct when solving $(12 + 5) \times 28$?

A. $12 \times 28 + 5$

B. $12 \times 28 + 17 \times 28$

C. $12 \times 28 + 28$

D. $12 \times 28 + 5 \times 28$

10 Calculate:

(1) $8 \times (125 + 4) = \underline{\hspace{2cm}}$

(2) $7 \times (100 - 1) = \underline{\hspace{2cm}}$

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1 Are the following calculations correct?

1. $5 + 2 + 5 = 5 + 5 + 2 = 10 + 2 = 12$

2. $3 - 2 + 11 = 3 - 11 + 2 = -6$

3. $4 \times 10 \times 25 = 4 \times 25 \times 10 = 100 \times 10 = 1000$

4. $63 \div 7 \times (-9) = -63 \div 9 \times 7 = -7 \times 7 = -49$

Answer TFTF

Solution $3 - 2 + 11 = 1 + 11 = 12$

$$63 \div 7 \times (-9) = -9 \times 9 = -81$$

2 $33 + 125 + 67 = \underline{\hspace{2cm}}.$

$$49 + 86 + 51 = \underline{\hspace{2cm}}.$$

$$2 \times 37 \times 5 = \underline{\hspace{2cm}}.$$

$$4 \times 318 \times 25 = \underline{\hspace{2cm}}.$$

Answer 1:225

2:186

3:370

4:31800

Solution $33 + 67 + 125 = 100 + 125 = 225$

$$49 + 51 + 86 = 100 + 86 = 186$$

$$2 \times 37 \times 5 = 2 \times 5 \times 37 = 10 \times 37 = 370$$

$$4 \times 318 \times 25 = 4 \times 25 \times 318 = 100 \times 318 = 31800$$

3 Are the following calculations correct?

1. $13 + 8 + 97 = 100 + 8 = 108$

2. $19 + (-13) + (-9) = 19 + (-9) + (-13) = 10 - 13 = -3$

3. $5 \times (-111) \times (-2) = 5 \times 2 \times 111 = 10 \times 111 = 1110$

4. $25 \times 101 \times 4 = 25 \times 4 \times 101 = 1010$

Answer FTTF

Solution $13 + 8 + 97 = 110 + 8 = 118$

$$25 \times 101 \times 4 = 25 \times 4 \times 101 = 100 \times 101 = 10100$$

4 $12 + 321 + 88 = \underline{\hspace{2cm}}$.

$73 + 606 + 27 = \underline{\hspace{2cm}}$.

$2 \times 425 \times 5 = \underline{\hspace{2cm}}$.

$4 \times 219 \times 25 = \underline{\hspace{2cm}}$.

Answer 1:421

2:706

3:4250

4:21900

Solution $12 + 88 + 321 = 100 + 321 = 421$

$$73 + 27 + 606 = 100 + 606 = 706$$

$$2 \times 5 \times 425 = 10 \times 425 = 4250$$

$$4 \times 25 \times 219 = 100 \times 219 = 21900$$

5 Are the following calculations correct?

1. $(2 + 12) + 88 = 2 + (12 + 88) = 2 + 100 = 102$

2. $(100 - 6) - 4 = 100 - 6 - 4 = 100 - (6 + 4) = 100 - 10 = 90$
3. $(77 \times 2) \times 5 = 77 \times (2 \times 5) = 77 \times 10 = 770$
4. $(60 \div 2) \div 3 = 60 \div 2 \div 3 = 60 \div (2 \times 3) = 10$

Answer TTTT

Solution The above calculations are all correct.

- 6 $(7878 + 99) + 1 = \underline{\hspace{2cm}}$.
- $(9970 - 999) - 1 = \underline{\hspace{2cm}}$.
- $(2345 \times 5) \times 2 = \underline{\hspace{2cm}}$.
- $(139 \times 25) \times 4 \div (-100) = \underline{\hspace{2cm}}$.

Answer 1:7978

2:8970

3:23450

4:-139

Solution $7878 + (99 + 1) = 7878 + 100 = 7978$

$$9970 - (999 + 1) = 9970 - 1000 = 8970$$

$$2345 \times (5 \times 2) = 2345 \times 10 = 23450$$

$$139 \times 100 \div (-100) = -139$$

- 7 Are the following calculations correct?

1. $(2 + 7) + 3 = 2 + (7 + 3) = 2 + 10 = 12$
2. $(10 - 7) - 3 = 10 - (7 - 3) = 10 - 4 = 6$
3. $(3 \times 2) \times 5 = 3 \times (2 \times 5) = 3 \times 10 = 30$
4. $(40 \div 4) \div 2 = 40 \div (4 \div 2) = 40 \div 2 = 20$

Answer TFTF

Solution Associative law doesn't apply in subtraction or division.

8 $(123 + 999) + 1 = \underline{\hspace{2cm}}$.
 $(848 - 99) - 1 = \underline{\hspace{2cm}}$.
 $(2021 \times 25) \times 4 = \underline{\hspace{2cm}}$.
 $(168 \times 2) \times 5 \div (-10) = \underline{\hspace{2cm}}$.

Answer 1:1123

2:748

3:202100

4:-168

Solution $123 + (999 + 1) = 123 + 1000 = 1123$

$$848 - (99 + 1) = 848 - 100 = 748$$

$$2021 \times (25 \times 4) = 2021 \times 100 = 202100$$

$$168 \times 10 \div (-10) = -168$$

9 Which of the following expressions is correct when solving $(12 + 5) \times 28$?

A. $12 \times 28 + 5$

B. $12 \times 28 + 17 \times 28$

C. $12 \times 28 + 28$

D. $12 \times 28 + 5 \times 28$

Answer D

Solution Distributive Property of Multiplication: $(a + b) \times c = a \times c + b \times c$

The answer is D.

10 Calculate:

(1) $8 \times (125 + 4) = \underline{\hspace{2cm}}$

(2) $7 \times (100 - 1) = \underline{\hspace{2cm}}$

Answer

(1) **1,032**

Alternative: **1032**

(2) **693**

Solution

(1) $8 \times (125 + 4)$

$$= 8 \times 125 + 8 \times 4$$

$$= 1,000 + 32$$

$$= 1,032$$

(2) $7 \times (100 - 1)$

$$= 7 \times 100 - 1 \times 7$$

$$= 700 - 7$$

$$= 693$$