EXERCISE 1B

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1. Multiply:

i. 16 by 9

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

=16×9 … [∵ (+ × += +)]

=144

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

ii. 18 by -6

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

=18×(-6) … [∵ (+ × −= −)]

=-108

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

iii. 36 by -11

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

=36×-11 … [∵ (+ × −= −)]

= -396

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

iv. – 28 by 14

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

=-28×14 … [∵ (− × += −]

= -392

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

v. – 53 by 18

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

=-53 × 18 … [∵ (− × += −]

= -94

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

vi. -35 by 0

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

$=-35\times0$

$= 0$

(∵ Any integer it may positive or negative multiplied by or to zero the result will be zero itself)

vii. 0 by -23

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

$=0\times-23$

$= 0$

(∵ Any integer it may positive or negative multiplied by or to zero the result will be zero itself)

viii. -16 by -12

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

$=-16\times-12$ … [∵(− × −= +)

$=192$

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

ix. -105 by -8

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

$=-105\times-8$ … [∵(− × −= +)

$=840$

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

x. -36 by -50

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

$= (-36)\times (-50)$ … [∵(− × −= +)

$= 1800$

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

xi. -28 by -1

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

= (-28) ×(-1) … [∵(− × −= +)]

= 28

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

xii. 25 by -11

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

= 25 × (-11) … [∵ (+ × −= −)]

= -275

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

2. Find each of the following products:

i. $\mathbf{3}\times \mathbf{4} \times (-\mathbf{5})$

Solution:-

Using the rule for Multiplication of integers.

In this question first we have to multiply the integers with same sign and then from the answer that we get is multiplied with other integer of different sign,

= ($\mathbf{3}\times 4) \times (-5)$

= (12) ×(-5) … [∵ (+ × −= −)]

= -60

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

ii. $\mathbf{2} \times (-\mathbf{5}) \times (-\mathbf{6})$

Solution:-

Using the rule for Multiplication of integers.

In this question first we have to multiply the integers with same sign and then from the answer that we get is multiplied with other integer of different sign,

= $\{2 \times (-5 \times -6)\}$ … [∵(− × −= +)]

= {2×30}

=60

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

iii. (-5) ×(-8) ×(-3)

Solution:-

Using the rule for Multiplication of integers.

In this question we have to multiply the first two integers and then from the answer that we get

is multiplied with other integer,

= {(-5 ×-8) × (-3)} … [∵(− × −= +)]
= {40 ×(-3)} … [∵ (+ × −= −)]
= -120

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

iv. (-6) × 6 × (-10)

Solution:-

Using the rule for Multiplication of integers.

In this question first we have to multiply the integers with same sign and then from the answer that we get is multiplied with other integer of different sign,

= {(-6×-10) ×6} ... [∵(− × −= +)]
= {60×6}
= 360

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

v. 7×(-8) ×3

Solution:-

Using the rule for Multiplication of integers.

In this question first we have to multiply the integers with same sign and then from the answer that we get is multiplied with other integer of different sign,

= {(7×3) ×(-8)}
= {21×-8} … [∵ (+ × −= −)]
=-168

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

vi. (-7) ×(-3) ×4

Solution:-

Using the rule for Multiplication of integers.

In this question first we have to multiply the integers with same sign and then from the answer that we get is multiplied with other integer of different sign,

= {(-7×-3) ×4} … [∵(− × −= +)]
= {21×4}
=84

(In multiplication we have to multiply the sign of the integers also and then assign the obtained sign to the answer)

3. Find each of the following products:

i. (-4) ×(-5) ×(-8) ×(-10)

Solution:-

Using the rule for Multiplication of integers.

In this question we have four integers of same sign, so multiply tow integers once and then from the answers of both set of integers again multiplied and get the final answer.

= {(-4 ×-5) ×(-8×-10)} … [∵(− × −= +)]

= {(20) × (80)}

=1600

ii. (-6) ×(-5) ×(-7) ×(-2) ×(-3)

Solution:-

Using the rule for Multiplication of integers.

In this question we have five integers of same sign, so multiply tow integers once and then from the answers of both set of integers again multiplied and get the final answer.

= {(-6×-5) ×(-7×-2) ×(-3)} … [∵(− × −= +)]

= {(30) ×(14) ×(-3)}

= {(30 ×14) ×(-3)}

= {(420×-3)} … [∵ (+ × −= −)]

= -1260

iii. (-60) ×(-10) ×(-5) ×(-1)

Solution:-

Using the rule for Multiplication of integers.

In this question we have five integers of same sign, so multiply tow integers once and then from the answers of both set of integers again multiplied and get the final answer.

= {(-60×-10) ×(-5×-1)} … [∵(− × −= +)]

= {(600) ×(5)}

= 3000

iv. (-30) ×(-20) ×(-5)

Solution:-

Using the rule for Multiplication of integers.

In this question we have 3 integers of same sign, so multiply tow integers once and

Then from the answers of both set of integers again multiplied and get the final answer.

= {(-30×-20) ×(-5)} … [∵(− × −= +)]

= {600×-5}

= -3000 … [∵ (+ × −= −)]

v. (-3) ×(-3) ×(-3) × … 6 times

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

= {(-3) ×(-3) ×(-3) ×(-3) ×(-3) ×(-3)}

= {(-3×-3) × (-3×-3) × (-3×-3)} … [∵(− × −= +)]

= {9×9×9}

= {(9×9) ×9)

= {81×9)

= 729

This can also be written as,

= $(-3)^6$

= 729

vi. **(-5) ×(-5) ×(-5) … 5 times**

Solution:-

Using the rule for Multiplication of integers.

The above question can be written as,

= {(-5) ×(-5) ×(-5) ×(-5) ×(-5)}

= {(-5×-5) ×(-5×-5) ×(-5) … [∵(− × −= +)]

= {(25) ×(25) ×(-5)}

= {(25×25) ×(-5)}

= {625 ×-5} … [∵(− × −= +)]

= -3125

This can also be written as,

$= (-5)^5$

= -3125

vii. **(-1) ×(-1) ×(-1) × … 200 times**

Solution:-

Using the rule for Multiplication of integers.

$= (-1)^{200} = 1$

(∵ Multiplying one with itself is 1 only. But, for deciding whether it is to be positive or negative by the value of powers, if it is even number the answer should be in positive or negative when it is odd number)

viii. **(-1) ×(-1) ×(-1) × … 171times**

Solution:-

Using the rule for Multiplication of integers.

$= (-1)^{200} = -1$

(∵ Multiplying one with itself is 1 only. But, for deciding whether it is to be positive or negative by the value of powers, if it is even number the answer should be in positive or negative when it is odd number)

4. **What will be the sign of the product, if we multiply 90 negative integers and 9 positives integers?**

Solution:-

If we multiply the 90 -ve integers the answer we are getting is positive integer. Because, 90 is an even number and the product of even number of negative integer is positive. The product of number of positive integer is not affect the sign of product. So the product obtained from this is positive.

5. **What will be the sign of the product, if we multiply 103 negative integers and 65 positives integers?**

Solution:-

If we multiply the 103 -ve integers the answer we are getting is negative integer. Because, 103 is an odd number and the product of odd number of negative integer is negative. The product of number of positive integer is not affect the sign of product. So the product obtained from this is negative.

6. **Simplify:**

i. **(-8) ×9 + (-8) ×7**

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]
Let,
a = -8, b = 9, c = 7
Then,
= (-8) ×9 + (-8) ×7
The above equation can be written as,
= (-8) ×(9+7) … [∵(a×b) + (a×c) = a ×(b+c)]
= (-8) ×(16) … [∵ (− × += −]
= -128

ii. 9 × (-13) +9 × (-7)

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]
Let,
a=9, b=-13, c=-7
Then,
= 9 × (-13) +9 × (-7)
The above equation can be written as,
=9 ×{(-13) + (-7)} … [∵(a×b) + (a×c) = a ×(b+c)]
= 9×{(-13-7)} … [∵(− × −= +)]
=9×{-20} … [∵ (+ × −= −)]
= -180

iii. 20 × (-16) + 20 × 14

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]
Let,
a=20, b=-16, c= 14
Then,
= 20 × (-16) + 20 × 14
The above equation can be written as,
= 20 × {(-16) + 14} … [∵(a×b) + (a×c) = a ×(b+c)]
= 20 × {-2} … [∵ (+ × −= −)]
= -40

iv. (-16) × (-15) + (-16) × (-5)

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]
Let,
a= -16, b= -15, c= -5
Then,
(-16) × (-15) + (-16) × (-5)
The above equation can be written as,
= (-16) × {(-15) + (-5)} … [∵(a×b) + (a×c) = a ×(b+c)]
= (-16) × {(-15- 5)} … [∵ (+ × −= −)]
= (-16) × {-20} … [∵(− × −= +)]
= 320

v. **(-11) × (-15)+ (-11) ×(-25)**

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]

Let,

a= -11, b= -15, c= -25

Then,

= (-11) × (-15) + (-11) ×(-25)

The above equation can be written as,

= (-11) × {(-15) + (-25)} … [∵(a×b) + (a×c) = a ×(b+c)]

= (-11) × {-15-25} … [∵ (+ × −= −)]

= (-11) × (-40) … [∵(− × −= +)]

= 440

vi. **10 × (-12) + 5 × (-12)**

Solution:-

Using the Distributive Law of Multiplication [(a×c) + (b×c) = (a + b) ×c)]

Let,

a= 10, b= 5, c= -12

Then,

=10 × (-12) + 5 × (-12)

The above equation can be written as,

= {(10+5) × (-12)} … [∵(a×c) + (b×c) = (a + b) ×c)]

= {(15) × (-12)} … [∵ (+ × −= −)]

= -180

vii. **(-16) × (-8) + (-4) × (-8)**

Solution:-

Using the Distributive Law of Multiplication [(a×c) + (b×c) = (a + b) ×c)]

Let,

a= -16, b= -4, c= -8

Then,

= (-16) × (-8) + (-4) × (-8)

The above equation can be written as,

= {((-16) + (-4)) × (-8)} … [∵(a×c) + (b×c) = (a + b) ×c)]

= {(-16-4) ×(-8)} … [∵ (+ × −= −)]

= {-20 × (-8)} … [∵(− × −= +)]

= 160

viii. **(-26) × 72 + (-26) × 28**

Solution:-

Using the Distributive Law of Multiplication [(a×b) + (a×c) = a ×(b+c)]

Let,

a= -26, b= 72, c= 28

Then,

= (-26) × 72 + (-26) × 28

The above equation can be written as,

= {(-26) ×(72 + 28)} … [∵(a×b) + (a×c) = a ×(b+c)]

= {(-26) ×(100)} … [∵(−×−=+)]

= -2600

7. Fill in the blank:

i. (-6) × (.....) = 6

Solution:-

Using the closure property of multiplication, [a×b = c]

Let,

a= -6, missing number b=x, c= 6

= (-6) ×(x) = 6

(By sending -6 from Left hand side to the denominator of the right hand side in the multiplication, the sign remain unchanged)

= x =$(\frac{6}{-6})$

(∵ ÷ Both numerator and denominator by 6)

= x= -1

ii. (-18) × (....) = (-18)

Solution:-

Using the closure property of multiplication, [a×b = c]

Let,

a= -18, missing number b=x, c= -18

= (-18) × (x) = (-18)

(By sending -18 from Left hand side to the denominator of the right hand side in the multiplication, the sign remain unchanged)

= x =$(\frac{-18}{-18})$

(∵ ÷ Both numerator and denominator by -18)

= x = 1

iii. (-8) × (-9) = (-9) × (....)

Solution:-

Using the Commutative law of multiplication [a×b = b×a]

Let,

a= -8, b=-9

= (-8) × (-9) = (-9) × (-8)

iv. 7× (-3) = (-3) × (.....)

Solution:-

Using the Commutative law of multiplication [a×b = b×a]

Let,

a= 7, b=-3

= 7 × (-3) = (-3) × (7)

v. {(-5) ×3}× (-6) = (....) × {3× (-6)}

Solution:-

Using the Associative law of Multiplication [(a × b) ×c = a× (b × c)]

Let,

a= -5, b=3, c= -6

= {(-5) ×3} × (-6) = (-5) × {3 × (-6)}

vi. **(-5) × (…) = 0**

Solution:-

Using the closure property of multiplication, [a×b = c]

Let,

a= -5, missing number b=x, c= 0

= (-5) × (x) = 0

(By sending -5 from Left hand side to the denominator of the right hand side in the multiplication, the sign remain unchanged)

= x =$(\frac{0}{-5})$

= x = 0

(∵ Anything is divided by zero the answer is zero itself)

8. **In a class test containing 10 questions, 5 marks are awarded for every correct answer and (-2) marks are awarded for every incorrect answer and 0 for each question not attempted.**

i. **Ravi gets 4 correct and 6 incorrect answer. What is his score?**

ii. **Reenu gets 5 correct and 5 incorrect answers. What is her score?**

iii. **Heena gets 2 correct and 5 incorrect answers. What is her score?**

Solution:-

From the question we have 5 marks for correct answer and (-2) marks for incorrect answer.

Now. We get,

i. Ravi's score,

4 correct answer = 4 × 5 = 20

6 incorrect answer = 6 × (-2) = -12

= 20+ (– 12)

=20 -12

= 8

ii. Reenu's score,

5 correct answer= 5×5 = 25

5 incorrect answer= 5× (-2) = -10

= 25 + (-10)

= 25 – 10

=15

iii. Heena's score,

2 correct answer = 2 × 5 = 10

5 incorrect answer = 5× (-2) = -10

3 not attempted = 0

= 10 + (-10) +0

= 10 -10

= 0

9. Which of the following statement are true and which are false?

i. The product of positive and a negative integer is negative.

Solution:-

True. … [∵(−×−=+)]

ii. The product of two negative integer is a negative.

Solution:-

False. Because the number of negative signs is even, the product will be a positive integer.

iii. The product of three negative integers is a negative integer.

Solution:-

True. Because the number of negative signs is odd, the product will be a negative integer.

iv. Every integer when multiplied with -1 gives its multiplicative inverse.

Solution:-

False. Because Multiplicative inverse of 6 = $(\frac{1}{6})$

v. Multiplication on integers is commutative.

Solution:-

True. (a×b) = (b×a), (2×3) = (3×2)

vi. Multiplication on integers is associative.

Solution:-

True. (a × b) ×c = a× (b × c), (2 × 3) ×4 = 2× (3 × 4)

vii. Every nonzero integer has a multiplicative inverse as an integer.

Solution:-

False. Every non-zero b has a multiplicative inverse 1b. Which is not an integer.