EXERCISE

In the Questions 1 to 25, there are four options, out of which only one is correct. Write the correct one.

1. When the integers 10, 0, 5, – 5, – 7 are arranged in descending or ascending order, then find out which of the following integers always remains in the middle of the arrangement.

(a) 0 (b) 5 (c) – 7 (d) – 5

Solution:

(a) 0

When the given integers are arranged in descending order we have: 10, 5, 0, -5, -7

When the given integers are arranged in an ascending order we have: -7, -5, 0, 5, 10

It's seen that in both the orders 0 always remains in the middle of the arrangement.

2. By observing the number line (Fig. 1.2), state which of the following statements is not true.

(a) B is greater than –10 (b) A is greater than 0

(c) B is greater than A (d) B is smaller than 0

Solution:

(c) B is greater than A.

Since, B lies to the left of zero and A lies to the right of zero on the number line clearly, A has to be greater than B.

3. By observing the above number line (Fig. 1.2), state which of the following statements is true.

(a) B is 2 (b) A is – 4 (c) B is –13 (d) B is – 4

Solution:

(d) B is -4

Each division on the number line is 1 unit apart. Then, B is 4 units from the left of zero.

4. Next three consecutive numbers in the pattern 11, 8, 5, 2, --, --, -- are

(a) 0, – 3, – 6 (b) – 1, – 5, – 8 (c) – 2, – 5, – 8 (d) – 1, – 4, – 7

Solution:

(d) -1, -4, -7

In the given sequence of numbers, each number differs by 3 from the previous number.

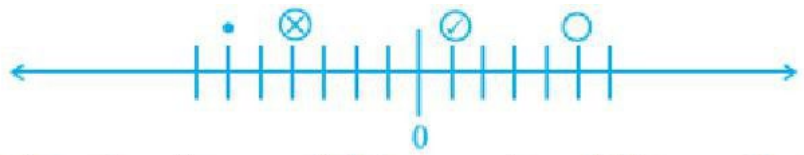
5. The next number in the pattern – 62, – 37, – 12 _____is
(a) 25 (b) 13 (c) 0 (d) –13
Solution:
(a) 13
It's found that the pattern is -62 + 25 = -37, -37 + 25 = -12
So, similarly -12 + 25 = 13

6. Which of the following statements is not true?
(a) When two positive integers are added, we always get a positive integer.
(b) When two negative integers are added we always get a negative integer.
(c) When a positive integer and a negative integer is added we always get a negative integer.
(d) Additive inverse of an integer 2 is (– 2) and additive inverse of (– 2) is 2.
Solution:
(c) When a positive integer and a negative integer is added we always get a negative integer.
The above statement is false as when a positive and a negative integer is added we may get a positive number or even zero.

7. On the following number line value 'Zero' is shown by the point

(a) X (b) Y (c) Z (d) W
Solution:
(C) Z
It's observed that each division on the number line is 5 units. So, from 10 taking two division to its left we get zero.

8. If ⊗, O, and • represent some integers on number line, then descending order of these numbers is



(a) •, ⊗, ⊘, ○ (b) ⊗, •, ⊘, ○ (c) ○, ⊘, ⊗, • (d) ○, •, ⊗, ⊘

Solution:

(c) ○, ⊘, ⊗, •

The descending order of these numbers is as in option (c).

9. On the number line, the value of (–3) × 3 lies on right hand side of

(a) – 10 (b) – 4 (c) 0 (d) 9

Solution:

(a) -10

As (-3) x 3 = -9

So, -9 lies to the right to -10.

10. The value of 5 ÷ (–1) does not lie between

(a) 0 and – 10 (b) 0 and 10 (c) – 4 and – 15 (d) – 6 and 6

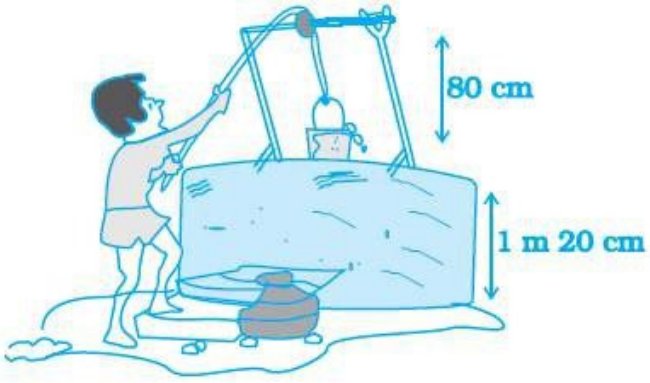
Solution:

(b) 0 and 10

The value of 5 ÷ (–1) = -5

As it is a negative number it doesn't lie between 0 and 10.

11. Water level in a well was 20m below ground level. During rainy season, rain water collected in different water tanks was drained into the well and the water level rises 5 m above the previous level. The wall of the well is 1m 20 cm high and a pulley is fixed at a height of 80 cm. Raghu wants to draw water from the well. The minimum length of the rope that he can use is



(a) 17 m (b) 18 m (c) 96 m (d) 97 m

Solution:
(a) 17 m
Given,
Height of the wall of the well = 1m 20 cm = 1.2 m
Height of the fixed pulley = 80 cm = 0.8 m
Initially water was available at a depth of 20 m below ground level.
Later, due to rain the water level was raised by 5 m.
Hence, the new depth at which water is available = 20 – 5 = 15 m
Thus,
The minimum length of the rope required to draw water from the well will be
(1.2 + 0.8 + 15) m = 17 m

12. (– 11) × 7 is not equal to
(a) 11 × (– 7) **(b) – (11 × 7)** **(c) (– 11) × (– 7)** **(d) 7 × (– 11)**
Solution:
(c) (– 11) × (– 7)
We have,
11 x (-7) = -77
- (11 x 7) = -77 and
7 x (-11) = -77
But, (-11) x (-7) = 77

13. (– 10) × (– 5) + (– 7) is equal to
(a) – 57 **(b) 57** **(c) – 43** **(d) 43**
Solution:
(d) 43
Using BODMAS rule,
(-10) x (-5) + (-7) = 50 – 7 = 43

14. Which of the following is not the additive inverse of a?
(a) – (– a) **(b) a × (– 1)** **(c) – a** **(d) a ÷ (–1)**
Solution:
(a) – (-a)
The additive inverse of a is – a
But, - (-a) = a

15. Which of the following is the multiplicative identity for an integer a?
(a) a (b) 1 (c) 0 (d) – 1
Solution:
(b) 1
The multiplicative identity of an integer a is 1. [As a x 1 = a]

16. [(– 8) × (– 3)] × (– 4) is not equal to
(a) (– 8) × [(– 3) × (– 4)] (b) [(– 8) × (– 4)] × (– 3)
(c) [(– 3) × (– 8)] × (– 4) (d) (– 8) × (– 3) – (– 8) × (– 4)
Solution:
(d) (– 8) × (– 3) – (– 8) × (– 4)
[(– 8) × (– 3)] × (– 4)
= (– 8) × [(– 3) × (– 4)]
= [(– 8) × (– 4)] × (– 3)
= [(– 3) × (– 8)] × (– 4)
But, [(– 8) × (– 3)] × (– 4) ≠ (– 8) × (– 3) – (-8) × (– 4)

17. (– 25) × [6 + 4] is not same as
(a) (– 25) × 10 (b) (– 25) × 6 + (– 25) × 4 (c) (– 25) × 6 × 4 (d) – 250
Solution:
(c) (– 25) × 6 × 4
(– 25) × [6 + 4]
= (– 25) × 10
= (– 25) × 6 + (– 25) × 4
= – 250
But, (– 25) × [6 + 4] ≠ (– 25) × 6 × 4

18. – 35 × 107 is not same as
(a) – 35 × (100 + 7) (b) (– 35) × 7 + (– 35) × 100
(c) – 35 × 7 + 100 (d) (– 30 – 5) × 107
Solution:
(c) – 35 × 7 + 100
– 35 × 107 = (– 30 – 5) × 107 = – 35 × (100 + 7) = (– 35) × 7 + (– 35) × 100
But, – 35 × 107 ≠ – 35 × 7 + 100

19. (– 43) × (– 99) + 43 is equal to
(a) 4300 (b) – 4300 (c) 4257 (d) – 4214

Solution:
(a) 4300
By BODMAS rule,
(– 43) × (– 99) + 43 = [(– 43) × (– 99)] + 43 = 4257 + 43 = 4300

20. (– 16) ÷ 4 is not same as
(a) (– 4) ÷ 16 (b) – (16 ÷ 4) (c) 16 ÷ (– 4) (d) – 4
Solution:
(a) (– 4) ÷ 16
(– 16) ÷ 4 = -4
But, (– 4) ÷ 16 = -1/4

21. Which of the following does not represent an integer?
(a) 0 ÷ (– 7) (b) 20 ÷ (– 4) (c) (– 9) ÷ 3 (d) (– 12) ÷ 5
Solution:
(d) (– 12) ÷ 5
0 ÷ (– 7) = 0, an integer
20 ÷ (– 4) = -5, an integer
(– 9) ÷ 3 = -3, an integer
But, (– 12) ÷ 5 = -2.4, which is a decimal and not an integer

22. Which of the following is different from the others?
(a) 20 + (–25) (b) (– 37) – (– 32) (c) (– 5) × (–1) (d) (45) ÷ (– 9)
Solution:
(c) (– 5) × (–1)
As all the remaining options give a value of -5
20 + (–25) = (– 37) – (– 32) = (45) ÷ (– 9) = -5
But, (– 5) × (–1) = 5

23. Which of the following shows the maximum rise in temperature?
(a) 23° to 32° (b) – 10° to + 1° (c) – 18° to – 11° (d) – 5° to 5°
Solution:
(b) – 10° to + 1°
As the difference in the temperature = 1° – (10°) = 11° (maximum)
Whereas,
23° to 32° = 32° - 23° = 9°
– 18° to – 11° = -11° - (-18)° = 7°

– 5° to 5° = 5° - (-5)° = 10°

24. If a and b are two integers, then which of the following may not be an integer?
(a) a + b (b) a – b (c) a × b (d) a ÷ b
Solution:
(d) a ÷ b
If a and b are two integers, then
a + b will always be an integer
a – b will always be an integer
a × b will always be an integer

25. For a non-zero integer a, which of the following is not defined?
(a) a ÷ 0 (b) 0 ÷ a (c) a ÷ 1 (d) 1 ÷ a
Solution:
(a) a ÷ 0
a ÷ 0 = a/0 is undefined

Encircle the odd one of the following (Questions 26 to 30).
26. (a) (–3, 3) (b) (–5, 5) (c) (–6, 1) (d) (–8, 8)
Solution:
(c) (–6, 1)
–3 + 3 = 0
–5 + 5 = 0
–8 + 8 = 0
–6 + 1 = -5
Hence, (–6, 1) is the odd one.

27. (a) (–1, –2) (b) (–5, +2) (c) (–4, +1) (d) (–9, +7)
Solution:
(d) (–9, +7)
–1 + (–2) = -3
–5 + 2 = -3
–4 + 1 = -3
–9 + 7 = -2
Hence, (–9, +7) is the odd one.

28. (a) (–9) × 5 × 6 × (–3) (b) 9 × (–5) × 6 × (–3)

(c) (–9) × (–5) × (–6) × 3 (d) 9 × (–5) × (–6) × 3

Solution:

(c) (–9) × (–5) × (–6) × 3

(–9) × 5 × 6 × (–3) = 810

9 × (–5) × 6 × (–3) = 810

(–9) × (–5) × (–6) × 3 = -810

9 × (–5) × (–6) × 3 = 810

Hence, (–9) × (–5) × (–6) × 3 is the odd one.

29. (a) (–100) ÷ 5 (b) (–81) ÷ 9 (c) (–75) ÷ 5 (d) (–32) ÷ 9

Solution:

(d) (–32) ÷ 9

Since, only (–32) ÷ 9 doesn't give an integer i.e. -32/9 = -3.5555555556

Hence, (–32) ÷ 9 is the odd one.

30. (a) (–1) × (–1) (b) (–1) × (–1) × (–1)

(c) (–1) × (–1) × (–1) × (–1) (d) (–1) × (–1) × (–1) × (–1) × (–1) × (–1)

Solution:

(b) (–1) × (–1) × (–1)

Since,

(–1) × (–1) = 1

(–1) × (–1) × (–1) × (–1) = 1

(–1) × (–1) × (–1) × (–1) × (–1) × (–1) = 1

But, (–1) × (–1) × (–1) = -1

Hence, (–1) × (–1) × (–1) is the odd one.

In Questions 31 to 71, fill in the blanks to make the statements true.

31. (–a) + b = b + Additive inverse of _____.

Solution:

a:

(–a) + b = b + (-a)

(–a) + b = b + Additive inverse of (a)

32. _____÷ (–10) = 0

Solution:

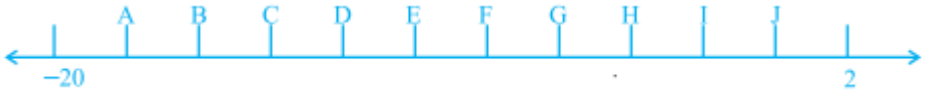
0:

0 ÷ (–10) = 0/(-10) = 0

33. (–157) × (–19) + 157 = _____
Solution:
3140:
(–157) × (–19) + 157 = (2983) + 157 = 3140

34. [(–8) + _____] + _____= _____+ [(–3) + _____] = –3
Solution:
-3, 8, -8, 8:
[(–8) + (-3)] + 8 = (-8) + [(–3) + 8] = –3

35. On the following number line, (–4) × 3 is represented by the point _____.



Solution:
D:
(-4) x 3 = -12
Each division on the number line is 2 units. So, D represent -12

36. If x, y and z are integers then (x +____) + z = _____+ (y + _____)
Solution:
y, x, z:
By associative property of integers, we have
(x + y) + z = x + (y + z)

37. (– 43) + _____= – 43
Solution:
0:
(– 43) + 0 = – 43

38. (– 8) + (– 8) + (– 8) = _____× (– 8)
Solution:
3:
(– 8) + (– 8) + (– 8) = -24 = 3 × (– 8)

39. 11 × (– 5) = – (_____× _____) = _____
Solution:
11, 5, -55:

$11 \times (-5) = -(11 \times 5) = -55$

40. $(-9) \times 20 =$ _____
Solution:
-180:
$(-9) \times 20 = -180$

41. $(-23) \times (42) = (-42) \times$ _____
Solution:
23:
$(-23) \times (42) = (-42) \times 23 = 966$

42. While multiplying a positive integer and a negative integer, we multiply them as _____numbers and put a _____sign before the product.
Solution:
whole, negative

43. If we multiply _____number of negative integers, then the resulting integer is positive.
Solution:
even

44. If we multiply six negative integers and six positive integers, then the resulting integer is _____
Solution:
positive integer
When even number of negative integers are multiplied the resulting integer is positive and when six positive integers are multiplied the resulting integer is also a positive.

45. If we multiply five positive integers and one negative integer, then the resulting integer is _____.
Solution:
negative
When odd number of negative integers are multiplied the resulting integer is negative. Also, when a negative and positive integer are multiplied the resulting integer is negative.

46. _____is the multiplicative identity for integers.
Solution:
1
1 is the multiplicative identity for integers.
i.e. 1 x a = a

47. We get additive inverse of an integer a when we multiply it by _____.
Solution:
-1:
a x (-1) = -a = additive inverse of (a)

48. (– 25) × (– 2) =
Solution:
50:
(– 25) × (– 2) = 25 x 2 = 50

49. (– 5) × (– 6) × (– 7) =
Solution:
-210:
(– 5) × (– 6) × (– 7) = - (5 × 6 × 7) = -210

50. 3 × (– 1) × (– 15) =
Solution:
45:
3 × (– 1) × (– 15) = (-3) x (-15) = 45

51. [12 × (– 7)] × 5 = ____× [(– 7) × ____]
Solution:
12, 5:
[12 × (– 7)] × 5 = 12 × [(– 7) × 5] (Associative property of integers)

52. 23 × (– 99) = ____× (– 100 + ____) = 23 × ____+ 23 × ____
Solution:
23, 1, -100, 1:
23 × (– 99) = 23 × (– 100 + 1) = 23 × (-100) + 23 × 1 (Distributive property of integers)

53. ____× (– 1) = – 35
Solution:
35:
35 × (– 1) = – 35

54. _____ × (– 1) = 47
Solution:
-47:
-47 × (– 1) = 47 (product of even number of negative integers is a positive integer)

55. 88 × ____ = – 88
Solution:
-1:
88 × -1 = – 88

56. ____× (–93) = 93
Solution:
-1:
-1 × (–93) = 93

57. (– 40) × ___= 80
Solution:
-2:
(– 40) × (-2) = 80

58. ____× (–23) = – 920
Solution:
40:
40 × (–23) = – 920

59. When we divide a negative integer by a positive integer, we divide them as whole numbers and put a _____sign before quotient.
Solution:
negative

60. When –16 is divided by _____the quotient is 4.
Solution:

-4:
Let -16 be divided by x and the quotient is 4
So, -16/x = 4
x = -4

61. Division is the inverse operation of _____
Solution:
Multiplication

62. 65 ÷ (– 13) =
Solution:
-5:
65 ÷ (– 13) = 65/ (-13) = -5

63. (– 100) ÷ (– 10) =
Solution:
10:
(– 100) ÷ (– 10) = (– 100)/ (– 10) = 10

64. (– 225) ÷ 5 =
Solution:
-45:
(– 225) ÷ 5 = -45

65. _____÷ (– 1) = – 83
Solution:
83:
83 ÷ (– 1) = – 83

66. _____÷ (– 1) = 75
Solution:
-75:
(-75) ÷ (– 1) = 75

67. 51 ÷ _____= – 51
Solution:
-1:

51 ÷ (-1) = – 51

68. 113 ÷ _____= – 1
Solution:
-113:
113 ÷ (-113) = – 1

69. (– 95) ÷ _____= 95
Solution:
-1:
(– 95) ÷ (-1) = 95

70. (– 69) ÷ (69) = _____
Solution:
-1
(– 69) ÷ (69) = (-69)/ 69 = -1

71. (– 28) ÷ (– 28) = _____
Solution:
1:
(– 28) ÷ (– 28) = (-28)/ (-28) = 1

In Questions 72 to 83, state whether the statements are True or False.
72. 5 – (– 8) is same as 5 + 8.
Solution:
True
5 – (– 8) = 5 + 8

73. (– 9) + (– 11) is greater than (– 9) – (– 11).
Solution:
False
(– 9) + (– 11) = - 19
But, (– 9) – (– 11) = – 9 + 11 = 2
So, -19 < 2
Hence, (– 9) + (– 11) < (– 9) – (– 11)

74. Sum of two negative integers always gives a number smaller than both the

integers.
Solution:
True
E.g.:
-4 + (-5) = -9
Now,
-4 > -9 and -5 > -9

75. Difference of two negative integers cannot be a positive integer.
Solution:
False
E.g.: -2 – (-5) = -2 + 5 = 3 (positive integer)

76. We can write a pair of integers whose sum is not an integer.
Solution:
False
Sum of two integers is always an integer.

77. Integers are closed under subtraction.
Solution:
True
The difference of two integers is always an integer.

78. (– 23) + 47 is same as 47 + (– 23).
Solution:
True
In case of addition even if the orders of integers are changed, as the values are equal both are equal.
(– 23) + 47 = 24 and 47 + (– 23) = 24

79. When we change the order of integers, their sum remains the same.
Solution:
True

80. When we change the order of integers their difference remains the same.
Solution:
False

E.g., 4 – 5 – 8 = -9
But, 5 – 4 – 8 = -7

81. Going 500 m towards east first and then 200 m back is same as going 200 m towards west first and then going 500 m back.
Solution:
True
Considering the originating point to the zero of a number line
In the first scenario: 500 – 200 = 300 m to the right from the starting point (0)
In the second scenario: -200 + 500 = 300 m to the right from the starting point (0)

82. (– 5) × (33) = 5 × (– 33)
Solution:
True
(– 5) × (33) = -165 and 5 × (– 33) = -165

83. (– 19) × (– 11) = 19 × 11
Solution:
True
As the product of numbers with same signs are equal to the absolute value
(– 19) × (– 11) = 19 × 11 = 209