CLASS- 6 A, B, C, D, E, F

SUBJECT: MATHEMATICS
CHAPTER INTEGERS

NOTE: Parents kindly ensure that the student understands the given examples to solve the questions that follow. A Maths text book of class 6 can be referred by the student for better understanding. They can also take help from Internet on the link given below:

Link: https://www.youtube.com/watch?v=2NiXgfMp9Mw&feature=youtu.be

➢ When smaller whole number is subtracted from a larger whole number, the result is always a positive whole number.
        For example: 15-6=9

➢ When a larger whole number is subtracted from a smaller whole number, the result is not a whole number.
        For example 6-15= -9

➢ For this reason, we need some new type of numbers which may represent the subtraction of a bigger whole number from a smaller whole number. These new type of numbers are always negative and a part of integers.

Integers

Corresponding to natural numbers 1,2,3,4,5,……etc. we create new numbers -1,-2,-3,-4,-5,….etc. called minus one, minus two,minus three,minus four,minus five etc.; where
    -1 is negative of 1
    -2 is negative of 2
    -3 is negative of 3
    and so on.
Combining these new numbers with whole numbers, we get a new collection of numbers, called integers.
Thus, integers   = …….,-5,-4,-3,-2,-1,0,1,2,3,4,5,…….
Positive integers = 1,2,3,4,5,……..
                = Natural numbers
Negative integers= -1,-2,-3,-4,-5,………
Also, 1+ (-1) = 0
     2 + (-2) = 0
     5 +(-5) = 0
   15+(-15)=0 and so on.

➢ (i) -1 and 1 are called opposites of each other.
    (ii) -2 and 2 are opposites of each other.
    (iii) -5 and 5 are opposites of each other.
       and so on.

➢ '0' zero is neither positive nor negative. It is a neutral integer.

In our day to day life, we come across many situations in which if:
    (i) profit is represented by a positive integer, then loss is represented by a negative integer.
    (ii) height above the sea level is represented by a positive integer, the depth below sea level is represented by a negative integer.
    (iii) if +5 represents 5 m due north, -5 represents 5m due south.
    and so on.

Representation of integers on number line:
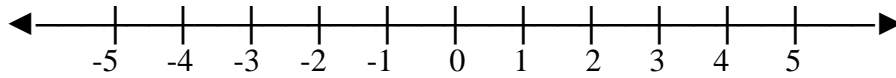
Ordering of integers:

(i) Every positive integer is greater than 0.
(ii) Every positive integer is greater than every negative integer.
(iii)Zero is greater than every negative integer and is less than every positive integer.
(iv)Every negative integer is smaller than every positive integer.

Note: The greater is an integer, the lesser is its negative (opposite).
  (i) Since, $10 > 6$ but $-10 < -6$
  (ii) Since, $8 > -3$ but $-8 < 3$
  (iii)Since, $-5 > -12$ but $5 < 12$
        and so on.

Now answer the following questions:

Q1) Fill in the blanks:

  (i) Negative of -20 is _____.
  (ii) Negative of 0 is _____.
  (iii)Negative of 8 is _____.
  (iv)If 10 represents gain of Rs. 10, then -10 represents _____.
  (v) If going south is negative then going north is_____.
  (vi) Because $5 < 7$, therefore -5 _____-7.

Q2) Write the following integers in ascending (increasing) order:

  (i) -5,8,0,-9,4,-14 and 12
  (ii) -6,7,0,-9,5 and 9

Q3) Write the following integers in descending (decreasing) order:

  (i) -10,0,3,-4,12,11,-1 and 5
  (ii) -4,3.-8,-12,-7 and 6

Addition of integers

➢ Rule1 : When both the integers are positive:
        Add them and assign plus sign to the result.
    For example:
        (i) +59 + (+32)= +91
        (ii) 78   + 45= 123
➢ Rule2: When both the integers are negative :
        Add them and assign minus sign to the result.
    For example:
        (i) (-43) + (-55) = -98
        (ii) (-123) + (-507) = -630

➤ Rule 3: When both the integers are of opposite signs:

   From the integer with greater numerical value subtract the integer with smaller numerical value and then assign (to the result) the sign of the integer with greater numerical value.

For example:

   (i) (-38) + 72

   Here both the integers are of opposite sign and the numerical value of 72 is greater than the numerical value of (-38) which is 38.

   ∴ From 72 subtract 38 and assign plus sign to the result.

   ∴ (-38) + 72 = 34

   Conversely, (-72) + 38 = -34

   (ii) (-95) + 43

   ∵ -95 has greater numerical value, so subtract 43 from 95 and assign minus sign to the result.

   ∴ -95 + 43 = -52   [As 95 – 43 = 52]

Subtraction of integers

➤ If the integer to be subtracted is positive, do the ordinary subtraction and if the integer to be subtracted is negative, change its sign and then add.

For example:

   (i) 8 –(5) = 8 – 5 = 3
   (ii) -8 – (5) = -8 – 5 = -13
   (iii)8 – (-5) = 8 + 5 =13
   (iv) -8 – (-5) = -8 + 5 = -3

More examples:

   (i) To subtract 5 from 9, change the sign of 5 and then add it to 9.
        Thus : 9 – 5 = 9 + (-5) = 4
   (ii) To subtract -5 from 9, change the sign of -5 and then add it to 9.
        Thus : 9 – (-5) = 9 + 5=14
   (iii)To subtract 5 from -8, change the sign of 5 and then add it to -8.
        ∴ -8 – 5 = -8 +(-5) = -13
   (iv)To subtract -8 from -5, change the sign of -8 and then add it to -5.
        ∴ -5 – (-8) = -5 + 8 = 3

Now answer the following questions:

Q4) **Add:**

   (i) 13 and 15
   (ii) -13 and 15
   (iii)13 and -15
   (iv)-13 and -15

Q5) **Add**:

   (i) 259 and 214
   (ii) -528 and -243
   (iii)-623 and 326
   (iv)258 and -473

Q6) **Subtract**:

    (i) 5 from 8
    (ii) -5 from 8
    (iii)4 from -7
    (iv)-8 from -2

Q7) **Subtract**:

    (i) -123 from 453
    (ii) -78 from -12
    (iii)329 from -124
    (iv)-222 from 0

Multiplication of integers

- Rule 1: When both the integers are of the same sign, then the result is positive.
  For example:
  - (i) $+4 \times (+6) = +24$
  - (ii) $8 \times (+10) = +80$
  - (iii)$-9 \times (-7) = +63$

- Rule 2: When both the integers are of opposite sign, then the result is negative.
  For example:
  - (i) $-6 \times (+8) = -48$
  - (ii) $3 \times (-12) = -36$
  - (iii)$-8 \times 9 = -72$

Division of integers

- Rule 1: When both the integers are of the same sign, then the result is positive.
  For example:
  - (i) $30 \div 5 = 6$
  - (ii) $-56 \div (-8) = +7$
  - (iii)$+72 \div (+12) = +6$

- Rule 2: When both the integers are of opposite sign, then the result is negative.
  For example:
  - (i) $-42 \div (+6) = -7$
  - (ii) $+88 \div (-11) = -8$
  - (iii) $-32 \div 4 = -8$

Q8) Multiply:

 (i) -1 and -7
 (ii) +6 and +9
 (iii) -16 and +2
 (iv) -8 and 0
 (v) -4 and 12
 (vi) 8 and -4
 (vii) 2 and 15

Q9) **Divide**:

 (i) 121 by 11
 (ii) 63 by -7
 (iii)-64 by -8
 (iv) +45 by +9
 (v) 0 by -11
 (vi)169 by + 13
 (vii) -96 by 3

"END"