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Question.1. $10^2 - 9^2 = (10 + 1)(10 - 1)$ [Marks : (4)]

$$= 19 \times 1$$

$$= 19$$

Using this

a) Find $11^2 - 10^2$?

b) Find $10^2 - 11^2$?

Ans.

$$11^2 - 10^2 = (11+10)(11 - 10)$$

$$= 21 \times 1$$

$$= 21$$

$$10^2 - 11^2 = (10 + 11)(10 - 11)$$

$$= 21 \times -1$$

$$= -21$$

Question.2. $9^2 = (10 + -1)^2$ [Marks : (4)]

$$= 10^2 + 2 \times 10 \times -1 + (-1)^2$$

$$= 100 - 20 + 1$$

$$= 81$$

Using this a) 19^2 ?

b) 98^2 ?

Ans. $19^2 = (20 + -1)^2$

$$= 20^2 + 2 \times 20 \times -1 + (-1)^2$$

$$= 361$$

$$98^2 = (100 + -2)^2$$

$$= 100^2 + 2 \times 100 \times -2 + (-2)^2$$

$$= 9604$$

Question.3. From the table find the appropriate answers from column B for the operations in column A ? [Marks : (3)]

column A

column B

a) $-7 + 21$

-14

b) $-(-8)$

18

c) -2×7

8

d) -3×-6

14

Ans. $-7 + 21 = 14$

$-(-8) = 8$

$-2 \times 7 = -14$

$-3 \times -6 = 18$

Question.4. If $x = -2$, $y = 4$, $z = -3$ find the value of the expressions given below and compare [Marks : (2)]

a) $xy + xz$

b) $x(y + z)$

Ans. $xy + xz = -2 \times 4 + -2 \times -3$

$= -8 + 6$

$= -2$

$x(y+z) = -2(4+-3)$

$= -2 \times 1$

$= -2$

Question.5. Find the values of $x^3 - 1$ if $x = 0, 1, -1$? [Marks : (3)]

Ans. $x = 0, x^3 - 1 = 0^3 - 1$

$= -1$

$x = 1, x^3 - 1 = 1^3 - 1$

$= 0$

$x = -1, x^3 - 1 = (-1)^3 - 1$

$= -2$

Question.6. Write the next three numbers in the given number sequence 13, 10, 7, 4, [Marks : (3)]

Ans. $4-3 = 1$

$1-3 = -2$

$-2-3 = -5$

Question.7. If $a=-2$, $b =2$, $c = -3$ find the value of $ab+ac$?[Marks :(2)]

Ans.

$$ab + ac = a(b+c)$$

$$= -2 (2 + -3)$$

$$= -2 \times -1$$

$$= 2$$

Question.8. Expand [Marks :(2)]

$$(x-5)(x-3)$$

$$\text{Ans. } (x-5)(x-3) = x^2 - 5x - 3x + 15$$

$$= x^2 - 8x + 15$$

Question.9. If $x = 5$ and $y =4$ find the value of $(x+y)$ and $(-x-y)$?[Marks :(2)]

$$\text{Ans. } 5 + 4 = 9$$

$$-5 -4 = -9$$

Question.10. Fill up the empty cells of the square below such that the adjacent numbers in each row and column differ by 2[Marks :(3)]

2		
	-2	
		-6

Ans.

2	0	-2
0	-2	-4
-2	-4	-6

Question.11. The time-speed relation of an object thrown upwards is[Marks :(2)]

$$v = 20 - 9.8 t$$

a) Find the speed of the object when $t = 2$ seconds ?

b) Find the speed of the object when $t = 3$ seconds ?

Ans. $V = 20 - 9.8 \times 2$

$$= 20 - 19.6$$

$$= 0.4 \text{ m/s}$$

$$y = 20 - 9.8 \times 3$$

$$= 20 - 29.4$$

$$= -9.4 \text{ m/s}$$

Question.12. In the equation $y = x^2 + 3x + 2$ [Marks :(2)]

a) If $x = -1$ find the value of y ?

b) If $x = -2$ find the value of y ?

Ans. $y = (-1)^2 + (3 \times -1) + 2$

$$= 1 - 3 + 2$$

$$= 0$$

$$y = (-2)^2 + (3 \times -2) + 2$$

$$= 4 - 6 + 2$$

$$= 0$$

Question.13. Simplify [Marks :(2)]

a) $(x-1) + (1-x) + (x-2) + (2-x)$

b) $(2x+3) + (3x-3) + (5-x) + (x-6)$

Ans. $x-1+1-x+x-2+2-x = 0$

$$2x+3+3x-3+5-x+x-6 = 5x-1$$

Question.14. Using the principle $-x - y = -(x + y)$ solve the following [Marks :(2)]

a) $-4 - 3$

b) $(-4 - 3) + 7$

Ans. $-4-3 = -7$

$$(-4 - 3) + 7 = -7 + 7 = 0$$

Question.15. Find the value of $\frac{1}{5} + \frac{1}{-3}$ using the principle [Marks :(2)]

$$\frac{1}{x} + \frac{1}{y} = \frac{x+y}{xy}$$

Ans.

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$$\frac{1}{5} + \frac{1}{-3} = \frac{-3+5}{5x-3} \quad (1)$$

$$= \frac{2}{-15} \quad (1)$$

Question.16. If $-4 \times a = 12$, find the value of a ?[Marks :(2)]

Ans. $A = 12 \div -4$

$$= 12 \times$$

$$= -3$$

Question.17. Given that $c = a+b$ [Marks :(2)]

a) If $a = -4$, $b = 5$ find the value of c ?

b) $a = -4$, $b = -5$ find the value of c ?

Ans. a) $c = -4 + 5 = 1$

b) $c = -4 + -5 = -9$

Question.18. a) If $x = 1$, find the values of $x + 1$, $x^3 - 2$, $x^2 - 2x + 1$?[Marks :(2)]

b) Write the numbers in ascending order ?

Ans. a) $x+1 = 1+1 = 2$

$$x^3 - 2 = 1^3 - 2 = -1$$

$$x^2 - 2x + 1 = 1^2 - 2 + 1 = 0$$

$$-1, 0, 2$$

Question.19. Using the equation $z = \frac{1}{x-1} + \frac{1}{y-1}$ solve the following[Marks :(4)]

a) $x=2$, $y=0$

b) $x=3$, $y=1$

c) $x=2$, $y=1$

Ans.

$$\frac{1}{1} + \frac{1}{1} = 2 \quad (1)$$

$$\frac{1}{2} + \frac{1}{2} = 1 \quad (1)$$

$$1 + \frac{1}{2} = 1 \frac{1}{2} \quad (1)$$

Question.20. Using the identity $xz+yz=(x+y)z$ solve the following[Marks :(3)]

a) $(-3 \times 5) + (3 \times 5)$

b) $(-64 \times 50) + (-36 \times 50)$

c) $(10 \times 99) + (10 \times -9)$

Ans. $(-3+3) \times 5 = 0 \times 5 = 0$

$(-64+-36) \times 50 = -100 \times 50 = -5000$

$(99+-9) \times 10 = 900$