*** Choose The Right Answer From The Given Options.[1 Marks Each]** **[4]**

1. 6a equals

   (A) 6 + a (B) 6 × a

   (C) a × a × a × a × a × a (D) 6 ÷ a

   Ans. : (B) 6 × a

2. 11 more than three times the number x can be represented as

   (A) 11 + x + 3 (B) 11x – 3 (C) 3x + 11 (D) 11x + 3

   Ans. : (C) 3x + 11

3. If each match box contains 40 matchsticks, the number of matchsticks required to fill n such boxes is-

   (A) 40 + n (B) 40n (C) 40 ÷ n (D) 40 – n

   Ans. : (B) 40n

4. If the length of each side of a regular hexagon is x metres, then the perimeter of given hexagon is-

   (A) (x + 6) metres (B) (x ÷ 6) metres (C) (x – 6) metres (D) (6 × x) metres

   Ans. : (D) (6 × x) metres

*** a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** **[1]**

5. **Assertion (A):** The perimeter of an equilateral triangle, if side of the triangle is m is 4m.

   Reason (R): In an equilateral triangle, each side length is equal.

   (A) Both assertion and reason are true and the reason is the correct explanation of assertion.

   (B) Both assertion and reason are true but the reason is not the correct explanation of the assertion.

   (C) Assertion is true and the reason is false.

   (D) Assertion is false and the reason is true.

   Ans. : (D) Assertion is false and the reason is true.

*** State Whether The Following Sentences Are True Or False.[1 Marks Each]** **[5]**

6. The area of a square having each side x is 4x.

   Ans. : False

7. The expression obtained when x is multiplied by 2 and then subtracted from 3 is 3 – 2x.

Ans. : True

8. Savita has p pencils in her box. She puts q more pencils in the box. The total number of pencils with her is p + q.

Ans. : True

9. The letter-number in the expression 2p + 3 is 2 and 3.

Ans. : False

10. t minutes are equal to 60/ seconds.

Ans. : True

*** Fill In The Blanks With Correct Alternative.[1 Marks Each]** **[5]**

11. 'x exceeds by 9' can be expressed as _____.

Ans. : x + 9

12. The number of days in w week is _____.

Ans. : 7w

13. The letter-number used in expression 4x + 8 is _____.

Ans. : x

14. The simplest form of 3x + 4y – 7 + x – 2y is _____.

Ans. : 4x + 2y – 7

15. Expression for total cost if "a pencil costs x and a pen costs 5x" is _____.

Ans. : 6x

*** Answer The Following Questions In One Sentence.[1 Marks Each]** **[5]**

16. What is the area of a square whose side is m cm?

Ans. : m × m square cm

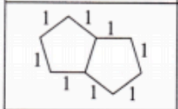
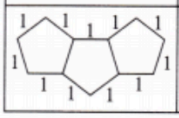
17. Write the rule for formula of perimeter (P) of a triangle where a, b and c are the sides of the triangle.

Ans. : P = a + b + c

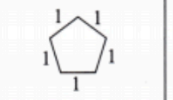
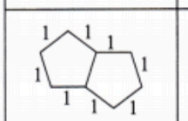
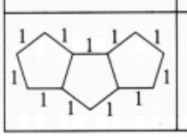
18. On my last birthday, I weighed 40 kg. If I put on m kg of weight after a year, what is my present weight?

Ans. : (40 + m)kg

19. Observe the following patterns and find a rule:

Pattern	Perimeter	Number of Unit Shapes (n)
	5	1
		2
		

Ans. :

Pattern	Perimeter	Number of Unit Shapes (n)
	5	1
	8	2
	11	3

20. Subtract $2x + y$ from the sum of $(x - 2xy + y)$ and $(3x + 2xy - 2y)$.

Ans. : $2(x - y)$

*** Questions With Calculation.[2 Marks Each]** **[2]**

21. Find the values of the following expressions for $x = 2$.
    (a) $2x - 5$
    (b) $4 + 3x$

Ans. : (a) Putting $x = 2$, $2x - 5 = 2 \times 2 - 5 = 4 - 5 = -1$
(b) Putting $x = 2$, $4 + 3x = 4 + 3 \times 2 = 4 + 6 = 10$

*** Questions With Calculation.[3 Marks Each]** **[6]**

22. Identify the following shape sequence. Can you identify the number pattern involved in it? Write it. And, extend the pattern by drawing next two shapes.

Ans. : Starting from 1 each shape of the given pattern is obtained by adding 1 vertex to the previous shape.
So, the number pattern involved is 1, 2, 3, 4, 5, 6, 7,...

And, next two shapes are :

23. Add the following :
(a) ab + bc and bc + ca
(b) 3x – y + z, 2y – 5z and 3z – 4x
(c) 3p – q + 5r, q – 2r and 3r – 2p + 7q

Ans. : (a) (ab + be) + (bc + ca)
= ab + (bc + be) + ca
= ab + (1 + 1)bc + ca
= ab + 2 be + ca

(b) 3x – y + z,2y – 5z and 3z – 4x (3x – y + z) + (2y – 5z) + (3z – 4x)
= (3x – 4x) + (-y + 2y) + (z – 5z + 3z)
= (3 – 4)x + (-1 + 2)y + (1 -5 + 3)z
= -x+y-z

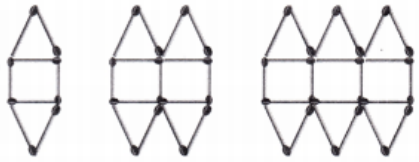
(c) 3p – q + 5r, q – 2r and 3r – 2p + 7q
= (3p – q + 5r) + (q – 2r) + (3r – 2p + 7q)
= (3p – 2p) + (—q + q + 7g) + (5r – 2r + 3r)
= -p + 7q + 6r

*** Questions With Calculation.[5 Marks Each]** **[35]**

24. Study the given patterns and complete the table that follows :

Number of figures formed	1	2	3	4	25	*n*
Number of matchsticks used						

(b)



Number of figures formed	1	2	3	4	25	50	n
Number of matchsticks used							

(c)

Number of figures formed	1	2	3	4	25	100	n
Number of matchsticks used							

Ans. : (a)It can be observed from the given figures that 2 matchsticks are fixed and 3 matchsticks are added at each step. The general term for the number of matchsticks in a figure will be 3n + 2.

The complete table is

Number of figures formed	1	2	3	4	25	n
Number of matchsticks	5	8	11	14	77	3n+2

(b)By observing the matchsticks pattern, the general term for the number of matchsticks will be 7n + 1.

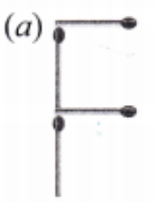
Number of figures formed	1	2	3	4	25	50	n
Number of matchsticks	8	15	22	29	176	351	7n+1

(c)By observing the matchsticks pattern, the genera term for the number of matchsticks will be 3n + 2.

Number of figures formed	1	2	3	4	25	100	n
Number of matchsticks	5	8	11	14	77	302	3n+2

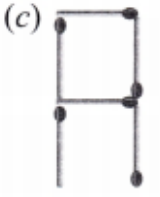
25. Make the following patterns using matchsticks and find the general rule. Use a letter-number to write the rule.

(a)

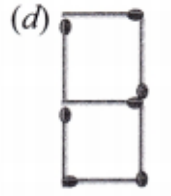


(b)

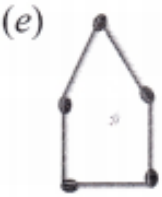
(c)



(d)



(e)



Ans. : (a)In the given figure there are 4 matchsticks. To get the two similar figures we need 8 matchsticks, for three similar figures 12 matchsticks, and so on.
So, the number of matchsticks in «th figure is An.

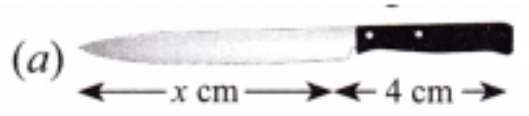
(b)Similar as part (a).
General term for n number of figures is 5n.

(c)To get the two similar figures, we just need to add 4 more matchsticks and so on.
The general rule is 4n + 2.

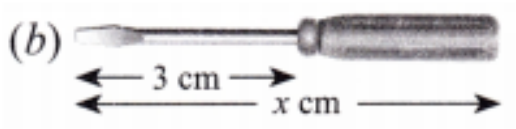
(d)To get the two similar figures, we just need to add 5 more matchsticks in the given figure, and so on.
The general rule is 5n + 2.

(e)To get the two similar figures, we just need to add 4 more matchsticks in the given figure, and so on.
The general rule is 4n + 1.

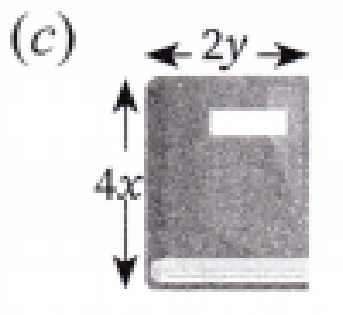
26. Look at the following and answer the questions :



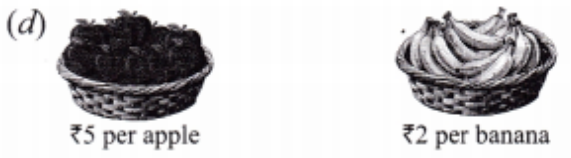
What is the length of the knife?



What is length of the handle of the screwdriver?



What is perimeter of the notebook?



If there are x apples and y bananas in the baskets. What is the total cost of the fruits altogether?

Ans. : (a)The length of the knife = x cm + 4 cm = (x + 4) cm

(b)The length of the handle of the screwdriver
= x cm – 3 cm
= (x – 3) cm

(c)Perimeter of the notebook = 2(length + breadth)
= 2(4x + 2y) units
Area of the notebook = (length × breadth) sq units
= 4x × 2y sq units

= 8xy sq units

(d)Total cost of the fruits = total cost of apples + total cost of bananas
= ₹ 5 × x + ₹ 2 × y
= ₹ 5x + ₹ 2y
= ₹ (5x + 2y)

27. Write expression for the following :
Take Ruhi's present age to be x years.
(a) What will be her age after 5 years from now?
(b) What was her age 3 years back?
(c) Ruhi's grandfather is 6 times her age. What is the age of her grandfather?
(d) Grandmother is 2 years younger than grandfather. What is grandmother's age?
(e) Ruhi's father's age is 5 years more than 3 times Ruhi's age. What is her father's age?

Ans. : (a) Ruhi's age after 5 years from now = Her present age + 5 years
= x years + 5 years
= (x + 5) years

(b) Ruhi's age 3 years back = Her present age – 3 years
= x years – 3 years
= (x – 3) years

(c) Grandfather's age = 6 × Ruhi's age
= 6 × x years
= 6x years

(d) Grandmother's age = Grandfather's age – 2 years = 6x years – 2 years
= (6x – 2) years

(e) Ruhi's father's age = 3 × Ruhi's age + 5 years
= 3 × x years + 5 years
= 3x years + 5 years
= (3x + 5) years

28. Subtract the following :
(a) 7a + 8b – c from 5a – b + 3c
(b) 2x – 3y from z – x
(c) 3pq – 2p + q from 4pq + 7p – 2p
(d) 11 xy – 5y + 2x from 15xy + y – x

Ans. : (a) (5a – b + 3c) – {la +8b — c)
= 5a-b + 3c-la-8b + c
= 5a-la-b-8b + 3c + c
(Rearranging like terms) = (5 – 7)a + (-1 -8)b + (3 + 1)c
= -2a -9b + 4c.

(b) (z – x) – (2x – 3y) = z – x – 2x + 3y
= z – 3x + 3y

(c) (4pqr + 7p – 2p) – (3pq – 2p + q)
= 4pq + 7p – 2p – 3pq + 2p – q
= 4pq – 3pq + 7p – 2p + 2p – q
= pq + 7p – q

(d) (15xy + y-x) – (11xy — 5y + 2x)
= 15 xy + y – x- 11 xy + 5y – 2x
= 15 xy – 11xy – x – 2x + y + 5y
= 4xy – 3x + 6y

29. In the given question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option as :
(i) Assertion (A) : Every algebraic expression has at least one letter-numbers.
Reason (R) : A letter-number is a symbol used to represent an unknown value in an expression.
(ii) Assertion (A) : If Aditi is x years of age now. 5 years ago her age was 10 years, then her present age is 15 years.
Reason (R) : We can express the given situation in form of expression as, x – 5 = 15.
(A) Both assertion and reason are true and the reason is the correct explanation of assertion.
(B) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
(C) Assertion is true and the reason is false.
(D) Assertion is false and the reason is true.

Ans. : (i) (a) Explanation: Every algebraic expression has at least one letter-numbers which is used to represent an unknown value in an expression. Hence, both assertion and reason are true.
(ii) (c) Explanation: Since, Aditi present age is of x. 5 years ago her age was 10 years, then her present age is 15 years. We can express this situation by the expression, x – 5 = 10, so the value of x is 15 years.
Hence, the assertion is true, but the reason is false.

30. Case-Based Question :

Rita is organising a school fair. She is in charge of budgeting for various stalls. She notes the following expenses :

→ The cost of each food stall is ₹ x.

→ The cost of each game stall is ₹ y.

→ She plans to have 4 food stalls and 3 game stalls.

There is a fixed decoration cost of ₹ 500.

Based on the above information, answer the following questions.

(a) Write an expression for the total cost to organise the school fair.

(b) What does the term 4x represent?

(c) If the cost of each food stall is ₹200 and each game stall is ₹ 150, what will be the total cost?

Ans. : (a) Since the cost of each food stall = ₹ x

So, the cost of 4 food stall = 4x

Since, the cost of each game stall = ₹ y

So, the cost of 3 game stall = 3y

And, the fixed decoration cost = ₹ 500

So, expression for the total cost to organise the school fair = 4x + 3y + 500.

(b) The term 4x represents cost of 4 food stalls.

(c) Since the expression for the total cost to organise the school fair is 4x + 3y + 500

So, the total cost when the cost of each food stall is ₹ 200 and each game stall is ₹ 150 is

4 × 200 + 3 × 150 + 500

= 800 + 450 + 500 = ₹ 1750.

*** case - based/data -based questions** **[4]**

A teacher asked two students, Aarav and Neha to list the materials needed for a craft project.

→ Aarav wrote: 3x + 2y, where x represents coloured paper sheets and v represents glue sticks.

→ Neha wrote: 5x – y, with the same meanings for x and y.

Based on the above information, answer the following question:

31. To avoid duplication, the teacher decides to combine the two lists. What is the combined list of materials in algebraic expression form?

32. If Neha decides to remove her list from the total, what will the expression be?

33. If 1 sheet of coloured paper costs ₹ 2 and 1 glue stick costs ₹ 5, what is the cost of the combined materials list?

Ans. : (1) 8x + y ,

(2) 3x + 2y ,

(3) ₹21 .

* **Match the following.** **[4]**

34. If Ritika's present age be x years. Match the statements with the expression.

Situation	Expression
(a) Her brother is 4 years younger than her.	(i) x + 27
(b) Her father's age exceeds her age by 30 years.	(ii) 9x
(c) Mother's age is 3 years less than that of her father.	(iii) 9x – 4
(d) Her grandfather's age is 9 times of her age.	(iv) x + 30
(e) Her grandmother's age is 4 years less than her grandfather.	(v) x – 4

Ans. :

Situation	Expression
(a) Her brother is 4 years younger than her.	(v) x – 4
(b) Her father's age exceeds her age by 30 years.	(iv) x + 30
(c) Mother's age is 3 years less than that of her father.	(i) x + 27
(d) Her grandfather's age is 9 times of her age.	(ii) 9x
(e) Her grandmother's age is 4 years less than her grandfather.	(iii) 9x – 4

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