

Algebraic Expression

Power
=

③

$2x$

↓ ↳ Base

Coefficient

① Linear Expression:
(Power = 1)

(a) Unlike term
more than one variable

$$\underline{x}^1 + \underline{y}^1 = 10$$

Data = Independent

eg ② $\underline{x}^1 + \underline{y}^1 + \underline{z}^1 = 50$

Like Term expression :-

Data = dependent

Variable = one :

I am twice the age of Gohar :

Gohar = x

Nareed = $2x$

Age problem

Quadratic expression y

Power = 2

G. Form =

$$\textcircled{2} \quad ax^2 + bx + c = 0$$

① Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

② Factorization Method

$$\textcircled{1} \quad ax^2 + bx + c = 0$$

$$x + y = b$$

$$xy = ac$$

$$\text{sgf} \quad 2x^2 + 18x + 28 = 0$$

Factorization Method :-

$$\underline{\underline{ac}} = 2 \times 28 = 56$$

$$\begin{array}{r} 56 \\ \times 2 \\ \hline 28 \end{array}$$

$$56 = 2 \times 2 \times 2 \times 7$$

$$56 = 4 \times 14$$

$$2x^2 + 14x + 4x + 28 = 0$$

$$2x(x+7) + 4(x+7) = 0$$

$$(x+7)(2x+4) = 0$$

$$x + 7 = 0$$

$$2x+4=0$$

$$2x = -4$$

$$x = \frac{-4}{2}$$

$$x = -2$$

$$x = -7, -2$$

✓ If a number and its fifth part added together becomes 48. What is the smallest number?

Sol: like Term expressions

$$\text{Number} = x$$

$$\text{5th part} = \frac{x}{5}$$

$$\text{Number} + \text{5th part} = 48$$

$$(x) + \left(\frac{x}{5}\right) = 48$$

$$\frac{5x + x}{5} = 48$$

$$\frac{6x}{5} = 48$$

$$x = \frac{48 \times 5}{6} = 40$$

$$\frac{x}{5} = \frac{40}{5} = 8$$

Sum of two numbers is 45. One of the numbers exceeds the other by 13. Find the numbers.

Hint = Dependent variable

Sol:- Let

$$\text{Number}(1) = x$$

$$\text{Num}(2) = x+13$$

$$\text{Num}(1) + (\text{Num}(2)) = 45$$

$$x + x+13 = 45$$

$$2x = 45 - 13$$

$$2x = 32$$

$$x = 16$$

$$\text{2nd No.} = x+13$$

$$= 16+13$$

$$= 29$$

$$16+29 = 45$$

A telephone company charges initially Rs. 0.50 and then Rs. 0.11, for every minute. Write an expression that gives the cost of a call that lasts 'N' minutes.
(CSS)

Sol: Initial min + every mins

$$\text{Total Mins} = N$$

$$\text{Rem Mins} = N-1$$

$$\text{Cost Price} = 0.50 + 0.11(N-1) \quad \text{--- (1)}$$

$$= \underline{0.50} + 0.11N - 0.11$$

$$= 0.39 + 0.11N \quad \text{--- (2)}$$

$$\Rightarrow CP = 0.50 + 0.11 N$$

$$= 0.50 + 0.11(1) \quad \left. \begin{array}{l} \text{let} \\ N = 1 \end{array} \right.$$

Wrong = $0.61 R_s \times$

$$CP = 0.50 + 0.11(CN-1) \quad \left. \begin{array}{l} \\ N = 1 \end{array} \right.$$

$$= 0.50 + 0.11(1-1)$$

$$= 0.50 + 0.11(0)$$

$$CP = 0.50 R_s \quad \checkmark \quad \text{Correct!}$$

✓ If the sum of two numbers is 30 and their difference is 8. What is their product? $\underline{\underline{=}}$ $\underline{\underline{=}}$

Sol: Let

$$\text{Number (1)} = x$$

$$\begin{array}{c} \text{Num (2)} \\ \text{LHS} \end{array} = \begin{array}{c} \text{RHS} \\ y \end{array}$$

$$\begin{array}{l} 1 \\ x + y = 30 \end{array} \quad \text{--- (1)}$$

$$\begin{array}{l} + \\ x - y = 8 \end{array} \quad \text{--- (2)}$$

$$\begin{array}{r} 2x \\ = 38 \end{array}$$

$$2x = 38$$

$$2x = 38$$

$$x = 19$$

Put in eq (1)

$$19 + y = 30$$

$$y = 30 - 19$$

$$y = 11$$

$$xy = 19 \times 11 = 209$$

✓ Two bus tickets from RWP to ISB and three tickets from RWP to Murree cost Rs. 770 but three tickets from RWP to ISB and two tickets from RWP to Murree cost Rs. 730. What are the fares for cities ISB and Murree from RWP? (CSS)

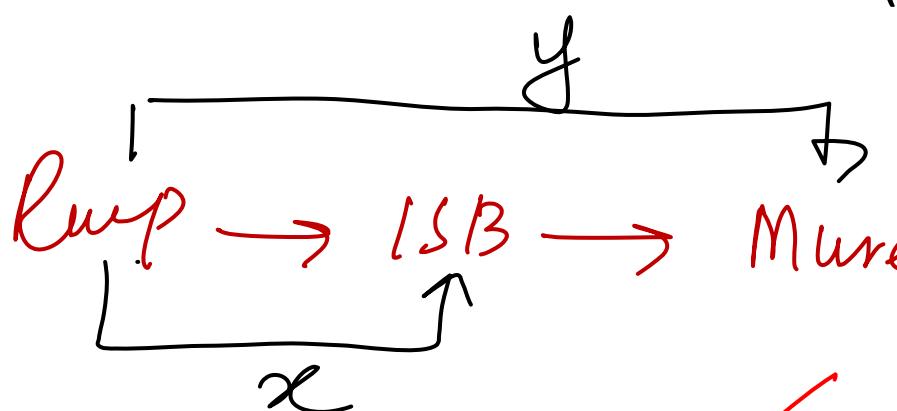


Diagram showing a path from RWP to ISB to Murree. A bracket under the path from RWP to ISB is labeled 'x'. A bracket under the path from ISB to Murree is labeled 'y'.

Given equations:

$$2x + 3y = 770 \quad (1)$$

$$3x + 2y = 730 \quad (2)$$

Operations:

$$\begin{array}{r} \text{eq } (1) \times 3 \quad \text{eq } (2) \times 2 \\ + 6x + 9y = 2310 \\ + 6x + 4y = 1460 \\ \hline 5y = 850 \\ y = 850/5 \\ y = 170 \end{array} \quad (3) \quad (4)$$

To Balance the eqs for the value of x ,

$$x = 130$$

Tayyaba visited a book store; she purchased three books and 8 pens for 4350, while the cost of two books and five pens is Rs. 2800. Find the cost of one book and one pen.

H. w

Zahid left a property worth Rs. 1,750,000. His family had to pay off a debt of Rs. 150,000. The rest of the money was distributed between a son and a daughter. How much did each child receive if the share of a son was double that of a daughter? (CSS)

The sum of two numbers is 18 and the product of these two numbers is 56. What are the numbers?

$$x \cdot w$$

A farmer keeps hens and rabbits on his farm. One day he counted the total of 70 heads and 196 legs. How many more hens than rabbits does he have? (CSS)

Sol: Eq. Formation

Hen = x

Rabbit = y

Head: $x + y = 70$ - ①

Legs: $2x + 4y = 196$ - ②

$2x + 2y = 140$ -
eq(2) - eq(3)

$2x + 4y = 196$
- $2x + 2y = 140$
—————
 $2y = +56$
 $y = 28$

To Balance:
eq① x 2

$x = 42$

In a farm, a farmer counted 78legs and 35heads consisting of cows and hens. How many hens does the farmer have?


$$H : W$$

If the sum of three-digit number is 15 and sum of 10th and unit digit is 12. The difference of unit digit from 10th digit is equal to 02. What is the three-digit number?

CSS-24

If the sum of four numbers is 105. When 03 is added to a number, twice of another number, five times of third number and fourth number becomes equal to each other. What are these numbers in ascending order

CSS-2024

1. The sum of three consecutive odd number is 273. What are the three odd numbers?
2. The sum of four consecutive integers is 210. Which one of these four integers is prime?
3. Find three consecutive even numbers with a sum of 72.
4. Sum of three consecutive prime number is 97. Find the numbers.
5. The sum of three consecutive prime number is 287. Find the numbers.

Age Problems

Ali is 28 years older than Basit. In 6 years, Ali will be twice as old as Basit. Find the present age of each.

Ayesha is 4 years older than Asif. Five years ago, the sum of their ages was 48. Their present ages are?

Rabia's age is twice that of Afsha's. Five years ago, Rabia was three times older than Afsha. Find the ages of both.

A father is three times as old as his son, and his daughter is 3 years younger than his son. If the sum of all three ages 3 years ago was 63 years, find the present age of the father.

A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of his son is?

Rashid is 7 years older than Sajid and the ratio between the ages of Sajid and Rashid is 7:9. Find the age of Rashid.

The sum of ages of 5 children born at the interval of 3 years is 50years. What is the age of the youngest child?

A is now 34 years old, and B is 4 years old. In how many years will A be twice as old as B.

The sum of the ages of John and Marry is 32. Four years ago, John was twice as old as Marry. Find the present age of each.

Sara's mother is 6 times old than Sara, where as her brother Ali is twice as old as Sara. In three years' time the sum of their age will be 72. How old are Sara, Ali and their mother? (CSS)

Present ages of Sami and Ali are in the ratio of 5:4 respectively. Three years hence, the ratio of their ages will become 11:9 respectively. What are the present ages of both?

Blood Relations

A is the son of C while C and Q are sisters to one another. Z is the mother of Q. If P is the son of Z, what is relation between P and A?

A, B & C are sisters. D is the brother of E and E is the daughter of B. How is A related to D?

A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C.

Pointing to a photograph of a boy Mr. Surab said, “He is the son of the only son of my mother.” How is Mr. Surab related to that boy?

1. Pointing at a photo, Danish said, “His father is the only son of my mother”. The photo belongs to?
2. Looking at a portrait of a man, Ali said, “His mother is the wife of my father’s son. Brother and sisters I have none”. At whose portrait was Ali looking?
3. If Ahmad says, “Afsha’s mother is the only daughter of my mother”, how is Ahmad related to Afsha?

A man said to a lady, “the son of your brother is the brother of my wife”. What is the lady to the man?

Read the following information carefully and answers the questions that are given below.

- a). P, Q, R, S, T and U are travelling in a bus.
- b). There are two reporters, two technicians, one photographer and one writer in the group.
- c). The photographer P is married to S who is a reporter.
- d). The writer is married to Q who is in the same profession as that 'U'.
- e). P, R, Q, S are two married couples and nobody in the group has same profession.
- f). U is brother of R.

Q1. Which is a pair of technicians?

Q2. Which is a pair of reporters?

Q3. How is R related to U?

A. Brother B. Sister C. Uncle D. Cannot be determined

Q4. Which of the following is a couple?

A. PQ B. QR C. QS D. PT

Q5. Which of them is a pair of husbands?

A. PQ B. PR C. QS D. Cannot be determined

Ans:

QU

ST

Cannot be determined

QR

Cannot be determined