

By. Er. Dharmendra Sir

7974073108, 9584873492

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

BASIC NOTES (CBSE/NCERT)

SIMPLE EQUATIONS

PART -1 OUT OF 1

6th, 7th & 8th

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∴ Simple equations :-

Q. Equation :- An equation is a condition on a variable such that two expressions in the variable should have equal value.

Q. Solution : The value of the variable for which the equation is satisfied is called the solution of the equation.

Q. In case of the balanced equation, if we -

- add the same number to both the sides.
- Subtract the same number from both the sides.
- multiply both sides by the same number.
- Divide both sides by the same numbers.



Ex - Write equations for the following statements :-

(i) The sum of number x and 4 is 9

Sol. Sum means (+) , is means (=)

$$x + 4 = 9$$



(ii) If you take away 6 from 6 times y , you get 60

Sol. $y \times 6 - 6 = 60$

$$6y - 6 = 60$$

(iii) Ten times a is 70

Sol. $a \times 10 = 70$

$$10a = 70$$

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Q. Solve $2p - 5 = 25$

Method - 1. Adding or Subtracting on both sides :-

$$2p - 5 = 25$$

$$2p - 5 + 5 = 25 + 5 \quad (\text{Adding } +5 \text{ both sides})$$

$$2p = 30$$

$$\frac{2p}{2} = \frac{30}{2}$$

(divide by 2 both sides)

$$p = 15$$

$$\begin{array}{r} 2 \overline{) 30} \quad 15 \\ \underline{-2} \\ 10 \\ \underline{-10} \\ 0 \end{array}$$



Method - 2 Transposing :-

$$2p - 5 = 25$$

$$2p = 25 + 5 \quad (\text{transposing } -5 \text{ sign change})$$

$$2p = 30$$

$$p = \frac{30}{2}$$

$$p = 15$$

(-) Convert into (+)
 (+) Convert into (-)
 Transposing 2 ($\div$) change into (x)
 (x) change into ($\div$)



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∴ Simple Equation :-

$$\textcircled{Q}. \quad 2y + \frac{5}{2} = \frac{37}{2}$$

$$\text{Sol.} \quad 2y = \frac{37}{2} - \frac{5}{2}$$

$$2y = \frac{37-5}{2}$$

$$2y = \frac{32}{2}$$

$$2y = 16$$

$$y = \frac{16}{2}$$

$$\boxed{y = 8}$$

This question type :-
required fraction.



$$\textcircled{Q}. \quad 2(x+4) = 12$$

Sol. method - 1

$$2(x+4) = 12$$

$$x+4 = \frac{12}{2}$$

$$x+4 = 6$$

$$x = 6-4$$

$$\boxed{x = 2}$$

method - 2

$$2(x+4) = 12$$

$$2x+8 = 12$$

$$2x = 12-8$$

$$2x = 4$$

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

$$\boxed{x = 2}$$



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∴ Simple Equations :-

Q. Irfan says that he has 7 marbles more than five times the marbles permit has. Irfan has 37 marbles. How many marbles does permit have?

Sol. more means (+) Compare Irfan and permit
times means (x) marble and represent in
equation then both are equal

Let permit's marble = x (condition shows)

Then according to question :-

$$\begin{aligned} \text{Irfan} &= \text{permit} \\ 37 &= x \times 5 + 7 \end{aligned}$$



$$\begin{aligned} 37 &= 5x + 7 \\ \boxed{5x + 7 = 37} &- \text{Equation} \end{aligned}$$

$$5x + 7 = 37$$

$$5x = 37 - 7$$

$$5x = 30$$

$$x = \frac{30}{5}$$



$$\boxed{x = 6} \quad \text{Therefore, permit's marbles are 6}$$

Note: Solve this type word problem compare the quantity and use above mention method always.

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Q. Write equations for the following statements :

(i) The sum of number x and 4 is 9

Sol. $x + 4 = 9$

(ii) 2 subtracted from y is 8

Sol. $y - 2 = 8$



(iii) Ten times a is 70

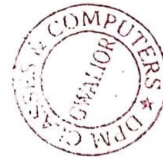
Sol. $10a = 70$

(iv) The number b divided by 5 gives 6.

Sol. $\frac{b}{5} = 6$

(v) Three-fourth of a number x minus 4 gives 4

Sol. $\frac{3}{4}x - 4 = 4$



(vi) Three-fourth of t is 15

Sol. $\frac{3}{4}t = 15$

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Q. one-fourth of a number x minus 4 gives 4.

Sol. $\frac{1}{4}x - 4 = 4$

(viii) Seven times m plus 7 gets you 77.

Sol. $7m + 7 = 77$

(ix) If you take away 6 from 6 times y , you get 60.

Sol. $6y - 6 = 60$

(x) If you add 3 to one-third of z , you get 30.

Sol. $\frac{1}{3}z + 3 = 30$



Q. Write the following equations in statement forms:

(i) $p + 4 = 15$

Sol. The sum of p and 4 is 15

(ii) $m - 7 = 3$

Sol. 7 subtracted from m is 3



(iii) $2m = 7$

Sol. Twice of a number m is 7

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$$(iv) \quad \frac{m}{5} = 3$$

Sol. one-fifth of m is 3

$$(v) \quad \frac{3m}{5} = 6$$

Sol. three-fifth of m is 6



$$(vi) \quad 3p + 4 = 25$$

Sol. Three times of a number p , when added to 4, gives 25.

$$(vii) \quad 4p - 2 = 18$$

Sol. When 2 is subtracted from four times of a number p , it gives 18



$$(viii) \quad \frac{p}{2} + 2 = 8$$

Sol. When 2 is added to half of a number p , it gives 8.

Q. Set up an equation in the following cases:

(i) Irfan says that he has 7 marbles more than five times the marbles Permit has. Irfan has 37 marbles.

Sol. Let Permit's marbles be m

5 × Number of marbles Permit has + 7 = No. of marbles Irfan

$$5 \times m + 7 = 37 \Rightarrow 5m + 7 = 37$$

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(ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age.

Sol. Let Laxmi's age is x years

$3 \times \text{Laxmi's age} + 4 = \text{Laxmi's father's age}$

$$3 \times y + 4 = 49$$

$$3y + 4 = 49$$



(iii) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87.

Sol. Let the lowest marks be l .

$2 \times \text{Lowest marks} + 7 = \text{Highest marks}$

$$2 \times l + 7 = 87$$

$$2l + 7 = 87$$



(iv) In an isosceles triangle, the vertex angle is twice either base angle.

Sol. Let the base angle be b

Vertex angle = $2 \times \text{base angle} = 2b$

Sum of all interior angles of a triangle = 180

$$b + b + 2b = 180 \Rightarrow 4b = 180$$

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Q. Give first the step you will use to separate the variable and then solve the equation:

(i) $x - 1 = 0$

Sol. Adding 1 to both sides of the given equation,
We obtain,

$$x - 1 + 1 = 0 + 1$$

$$x = 1$$



(ii) $x + 1 = 0$

Subtracted 1 from both sides of the given equation,

We obtain,

$$x + 1 - 1 = 0 - 1$$

$$x = -1$$



(iii) $x - 1 = 5$ (iv) $x + 6 = 2$ (v) $y - 4 = 7$

(vi) $y - 4 = 4$ (vii) $y + 4 = 4$ (viii) $y + 4 = -4$

[do it self]

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Q. Give first the step you will use to separate the variable and then solve the equation.

(i) $3l = 42$

sol. Dividing both sides of the given equation by 3,

We obtain,

$$\frac{3l}{3} = \frac{42}{3}$$

$$l = 14$$



(ii) $\frac{b}{2} = 6$

sol. multiplying both sides of the given equation by 2,

We obtain,

$$\frac{b}{2} \times 2 = 6 \times 2$$

$$b = 12$$



(iii) $\frac{p}{7} = 4$ (iv) $4x = 25$ (v) $8y = 36$

(vi) $\frac{z}{3} = \frac{5}{4}$ (vii) $\frac{a}{5} = \frac{7}{15}$ (viii) $20t = -10$

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Q. Give the steps you will use to separate the variable and then solve the equation:

(i) $3n - 2 = 46$

Sol. Adding 2 both sides of the given equation,
we obtain

$$3n - 2 + 2 = 46 + 2$$

$$3n = 48$$



Dividing both sides of the given equation by 3,
we obtain

$$\frac{3n}{3} = \frac{48}{3}$$

$$\boxed{n = 16}$$



(ii) $5m + 7 = 17$

(iii) $\frac{20p}{3} = 40$

(iv) $\frac{8p}{10} = 6$

[do it-self]

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Q. Solve the following equations :

(a) $10p = 100$

Solve : $10p = 100$

$$\frac{10p}{10} = \frac{100}{10}$$

$$\boxed{p = 10}$$

(b) $\frac{3p}{4} = 6$

Solve $\frac{3p}{4} = 6$

$$\frac{3p}{4} \times \frac{4}{3} = 6 \times \frac{4}{3}$$

$$p = 2 \times 4$$

$$\boxed{p = 8}$$



(c) $10p + 10 = 100$ (d) $\frac{p}{4} = 5$ (e) $\frac{-p}{3} = 5$

(f) $\frac{3p}{4} = 6$ (g) $3b = -9$ (h) $3b + 12 = 0$

(i) $3b = 0$ (j) $2q = 6$ (k) $2q - 6 = 0$

(L) $2q + 6 = 0$ (m) $2q + 6 = 12$

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Q. Solve the following equations :

$$(a) \quad 2y + \frac{5}{2} = \frac{37}{2}$$

Solve : $2y + \frac{5}{2} = \frac{37}{2}$

$$2y = \frac{37}{2} - \frac{5}{2}$$

$$2y = \frac{37-5}{2}$$

$$2y = \frac{32}{2}$$

$$y = \frac{32}{2} \times \frac{1}{2}$$

$$\boxed{y = 8}$$



$$(c) \quad \frac{a}{3} + 5 = 2$$

Sol. $\frac{a}{3} + 5 = 2$

$$\Rightarrow \frac{a}{3} = 2 - 5$$

$$\Rightarrow \frac{a}{3} = -3$$

$$\Rightarrow a = -3 \times 3$$

$$\boxed{a = -9}$$



$$(b) \quad 5t + 28 = 10$$

Solve: $5t + 28 = 10$

$$5t = 10 - 28$$

$$5t = -18$$

$$\boxed{t = \frac{-18}{5}}$$

Sol: $\frac{q}{4} + 7 = 5$

$$\frac{q}{4} = 5 - 7$$

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

$$q = -2 \times 4$$

$$\boxed{q = -8}$$

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(e) $\frac{5}{2}x = -5$

Sol. $\frac{5}{2}x = -5$

$$x = -5 \times \frac{2}{5}$$

$$x = -2$$

(f) $\frac{5}{2}x = \frac{25}{4}$

Sol. $\frac{5}{2}x = \frac{25}{4}$

$$x = \frac{25}{4} \times \frac{2}{5}$$

$$x = \frac{5 \times 1}{2 \times 1}$$

$$x = \frac{5}{2}$$

(g) $7m = 13 - \frac{19}{2}$

Sol. $7m = 13 - \frac{19}{2}$

$$7m = 13 \times \frac{2}{2} - \frac{19}{2}$$

$$7m = \frac{26}{2} - \frac{19}{2}$$

$$7m = \frac{26-19}{2}$$

$$7m = \frac{7}{2}$$

$$m = \frac{7}{2} \times \frac{1}{7}$$

$$m = \frac{1}{2}$$



(h) $6z + 10 = -2$

(i) $\frac{3l}{2} = \frac{2}{3}$

(j) $\frac{2b}{3} - 5 = 3$

[do it self]

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Q. Solve the following equations :

(i) $2(x+4) = 12$

Sol. $2(x+4) = 12$

$$x+4 = \frac{12}{2}$$

$$x+4 = 6$$

$$x = 6-4$$

$$\boxed{x = 2}$$

(ii) $3(h-5) = -21$

$$h-5 = \frac{-21}{3}$$

$$h-5 = -7$$

$$h = -7+5$$

$$\boxed{h = -2}$$



(iii) $3(h-1) = 21$

Sol. $3(h-1) = 21$

$$h-1 = \frac{21}{3}$$

$$h-1 = 7$$

$$h = 7+1$$

$$\boxed{h = 8}$$



(iv) $-4(2+x) = 8$

$$2+x = \frac{8}{-4}$$

$$2+x = -2$$

$$x = -2-2$$

$$\boxed{x = -4}$$

(v) $4(2-x) = 8$

[do it self]

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Q. Solve the following equations:

(i) $4 = 5(p-2)$ (iii) $4 + 5(p-1) = 34$

Sol. $4 = 5(p-2)$

$4 = 5p - 10$

$4 + 10 = 5p$

$14 = 5p$

$\boxed{\frac{14}{5} = p}$

$4 + 5p - 5 = 34$

$-1 + 5p = 34$

$5p = 34 + 1$

$5p = 35$

$p = \frac{35}{5}$

$\boxed{p = 7}$



(ii) $16 = 4 + 3(t+2)$

Sol. $16 = 4 + 3t + 6$

$16 = 10 + 3t$

$16 - 10 = 3t$

$6 = 3t$

$\frac{6}{3} = t$

$\boxed{2 = t}$



(iv) $0 = 16 + 4(m-6)$

$0 = 16 + 4m - 24$

$0 = -8 + 4m$

$8 = 4m$

$\frac{8}{4} = m$

$\boxed{2 = m}$

(v) $-4 = 5(p-2)$

[do it self]

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Q. Construct 3 equations with $x = 2$ Sol. $x = 2$

multiply both sides by 5

$$5x = 10 \quad \dots (i)$$

subtracting 3 from both sides

$$5x - 3 = 10 - 3$$

$$5x - 3 = 7 \quad \dots (ii)$$

dividing both side by 2

$$\frac{5x - 3}{2} = \frac{7}{2}$$

$$\frac{5x}{2} - \frac{3}{2} = \frac{7}{2} \quad \dots (iii)$$

Q. Construct 3 equations starting with $x = -2$.

Sol. [do it self]



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Q. Setup equations and solve them to find the unknown in the following cases:

(a) Add 4 to eight-times a number; you get 60.

Sol. Let the number be x

8 times of this number = $8 \times x = 8x$

$$8x + 4 = 60$$

$$8x = 60 - 4$$

$$8x = 56$$

$$x = \frac{56}{8}$$

$$\boxed{x = 7}$$

Therefore, the number is 7.

(b) one-fifth of a number minus 4 gives 3.

Sol. Let the number is x

one-fifth of a number = $\frac{1}{5} \times x = \frac{x}{5}$

$$\frac{x}{5} - 4 = 3$$

$$\frac{x}{5} = 3 + 4$$

$$\frac{x}{5} = 7$$

$$x = 7 \times 5$$

$$\boxed{x = 35}$$

Therefore, the number is 35.

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Q. If I take three-fourths of a number and add 3 to it, I get 21.

Sol. Let the number be x

$$\text{three-fourth of a number} = \frac{3}{4} \times x = \frac{3x}{4}$$

$$\frac{3x}{4} + 3 = 21$$

$$\frac{3x}{4} = 21 - 3$$

$$\frac{3x}{4} = 18$$

$$x = \frac{18 \times 4}{3}$$

$$x = 6 \times 4$$

$$\boxed{x = 24}$$

Therefore, the number is 24.

(d) When I subtracted 11 from twice a number, the result was 15.

Sol. Let the number be x

$$\text{Twice a number} = 2 \times x = 2x$$

$$2x - 11 = 15$$

[do it self]

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Q. Munna subtracted thrice the number of notebooks he has from 50, he finds the result to be 8.

Sol. Let the number be x

$$\text{thrice of the number} = 3 \times x = 3x$$

$$50 - 3x = 8$$

$$-3x = 8 - 50$$

$$-3x = -42$$

$$x = \frac{-42}{-3}$$

$$\boxed{x = 14}$$



Therefore, the number is 14

(f) Ibenhal thinks of a number. If she adds 19 to it and divides the sum by 5, she will get 8.

Sol. Let the number be x

$$\frac{x+19}{5} = 8$$

$$x+19 = 8 \times 5$$

$$x+19 = 40$$

$$x+19 = 40$$

$$x = 40 - 19$$

$$x = 21$$

Therefore, the number is 21



20.

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Q. Ram thinks of a number. If he takes away 7 from $\frac{5}{2}$ of the number, the result is 23.

Sol. Let the number be x

$$\frac{5}{2} \text{ of this number} = \frac{5x}{2}$$

$$\frac{5x}{2} - 7 = 23$$

$$\frac{5x}{2} = 23 + 7$$

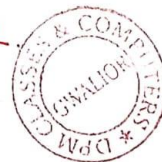
$$\frac{5x}{2} = 30$$

$$x = 30 \times \frac{2}{5}$$

$$x = 6 \times 2$$

$$x = 12$$

Therefore, the number is 12.



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Q. Solve the following :-

(i) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. What is the lowest score?

Sol. Let the lowest score be x

$$2 \times \text{lowest marks} + 7 = \text{highest marks}$$

$$2x + 7 = 87$$

$$2x = 87 - 7$$

$$2x = 80$$

$$x = \frac{80}{2}$$

$$\boxed{x = 40}$$

Therefore, the lowest score is 40.



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Q. In an isosceles triangle, the base angles are equal. The vertex angle is 40° . What are the base angles of the triangle?

Sol. Let the base angles be equal to b

the sum of all interior angles of a triangle is 180°

$$b + b + 40 = 180$$

$$2b = 180 - 40$$

$$2b = 140$$

$$b = \frac{140}{2}$$

$$\boxed{b = 70^\circ}$$

Therefore, the base angles of the triangles are of 70°



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Q. Sachin scored twice as many runs as Rahul. Together their runs fell two short of a double century. How many runs did each one score?

Sol. Let Rahul's score be x

Therefore, Sachin's score be $2x$

$$\text{Rahul's score} + \text{Sachin's score} = 200 - 2$$

$$x + 2x = 198$$

$$3x = 198$$

$$x = \frac{198}{3}$$

$$x = 66$$

Therefore, Rahul's score = 66

$$\text{Sachin's score} = 2 \times 66 = 132$$



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Q. Irfan says that he has 7 marbles more than five times the marbles permit has. Irfan has 37 marbles. How many marbles does permit have?

Sol. Let permit's marbles equal x

5 times the number of marbles permit has = $5x$

$$5x + 7 = 37$$

$$5x = 37 - 7$$

$$5x = 30$$

$$x = \frac{30}{5}$$

$$\boxed{x = 6}$$

Therefore, permit has 6 marbles.

Q. Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?

Sol. Let Laxmi's age be x years

$3 \times \text{Laxmi's age} + 4 = \text{Her father's age}$

$$3x + 4 = 49$$

$$3x = 49 - 4$$

$$3x = 45$$

$$x = \frac{45}{3}$$

$$x = 15$$

Therefore, Laxmi's age 15 years.

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Q. People of Sunder-gram planted trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees were two more than three times the number of fruit trees. What was the number of fruit trees planted if the number of non-fruit trees planted was 77?

Sol. Let the number of fruit trees be x

$3 \times \text{Number of fruit trees} + 2 = \text{Number of non-fruit trees}$

$$3x + 2 = 77$$

$$3x = 77 - 2$$

$$3x = 75$$

$$x = \frac{75}{3}$$

$$\boxed{x = 25}$$



Therefore, the number of fruit trees was 25.

Q. Solve the following riddle.

I am a number

Tell my identity

Take me seven times over

and add a fifty

To reach a triple century

You still need forty!



[do it self]

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Q. Solve the following equations:

1. $x - 2 = 7$

Sol. $x - 2 = 7$

$$x = 7 + 2$$

$$\boxed{x = 9}$$

5. $6x = 12$

Sol. $6x = 12$

$$x = \frac{12}{6}$$

$$\boxed{x = 2}$$

2. $y + 3 = 10$

Sol. $y + 3 = 10$

$$y = 10 - 3$$

$$\boxed{y = 7}$$

6. $\frac{t}{5} = 10$

Sol. $\frac{t}{5} = 10$

$$t = 10 \times 5$$

$$\boxed{t = 50}$$

3. $6 = z + 2$

Sol. $6 = z + 2$

$$6 - 2 = z$$

$$\boxed{4 = z}$$

7. $\frac{2x}{3} = 18$

Sol. $\frac{2x}{3} = 18$

$$x = 18 \times \frac{3}{2}$$

$$x = 9 \times 3$$

$$\boxed{x = 27}$$

4. $\frac{3}{7} + x = \frac{17}{7}$

Sol. $x = \frac{17}{7} - \frac{3}{7}$

$$= \frac{17-3}{7}$$

$$= \frac{14}{7} = 2$$



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$$7. \quad 1.6 = \frac{y}{1.5}$$

$$\text{Sol.} \quad 1.6 = \frac{y}{1.5}$$

$$1.6 \times 1.5 = y$$

$$\frac{16 \times 15^3}{10 \times 10^2} = y$$

$$\frac{8 \times 3}{10} = y$$

$$\frac{24}{10} = y$$

$$\boxed{2.4 = y}$$

$$9. \quad 7x - 9 = 16$$

$$\text{Sol.} \quad 7x - 9 = 16$$

$$7x = 16 + 9$$

$$7x = 25$$

$$\boxed{x = \frac{25}{7}}$$

$$10. \quad 14y - 8 = 13$$

$$\text{Sol.} \quad [\text{do it self}]$$

$$11. \quad 17 + 6p = 9$$

$$\text{Sol.} \quad 17 + 6p = 9$$

$$6p = 9 - 17$$

$$6p = -8$$

$$p = \frac{-8}{6}$$

$$\boxed{p = -\frac{4}{3}}$$



$$12. \quad \frac{x}{3} + 1 = \frac{7}{15}$$

$$\text{Sol.} \quad \frac{x}{3} + 1 = \frac{7}{15}$$

$$\frac{x}{3} = \frac{7}{15} - 1$$

$$\frac{x}{3} = \frac{7}{15} - \frac{1}{1} \times \frac{15}{15}$$

$$\frac{x}{3} = \frac{7}{15} - \frac{15}{15}$$

$$\frac{x}{3} = \frac{7-15}{15}$$

$$\frac{x}{3} = \frac{-8}{15}$$

$$x = \frac{-8}{15} \times \frac{3}{1}$$

$$\boxed{x = -\frac{8}{5}}$$



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Q. If you subtract $\frac{1}{2}$ from a number and multiply the result by $\frac{1}{2}$, you get $\frac{1}{8}$. What is the number?

Sol. Let the number be x

$$(x - \frac{1}{2}) \times \frac{1}{2} = \frac{1}{8}$$

$$x - \frac{1}{2} = \frac{1}{8} \times \frac{2}{1}$$

$$x - \frac{1}{2} = \frac{1}{4}$$

$$x = \frac{1}{4} + \frac{1}{2}$$

$$x = \frac{1}{4} + \frac{1}{2} \times \frac{2}{2}$$

$$x = \frac{1}{4} + \frac{2}{4}$$

$$x = \frac{1+2}{4}$$

$$x = \frac{3}{4}$$

Therefore, the number is $\frac{3}{4}$

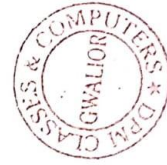


DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The perimeter of a rectangular swimming pool is 154 m. Its length is 2 m more than twice its breadth. What are the length and the breadth of the pool?

Sol. Let the breadth be x m
 then the length be $(2x+2)$ m
 Perimeter = 154 m



$$\begin{aligned} \text{Perimeter of rectangular swimming pool} &= 2(l+b) \\ 154 &= 2(x+2x+2) \end{aligned}$$

$$\frac{154}{2} = 3x+2$$

$$77 = 3x+2$$

$$77-2 = 3x$$

$$75 = 3x$$

$$\frac{75}{3} = x$$



$$\boxed{25 = x}$$

Therefore, breadth is = 25 m

$$\begin{aligned} \text{and length is} &= 2 \times 25 + 2 \\ &= 50 + 2 \\ &= 52 \text{ m.} \end{aligned}$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The base of an isosceles triangle is $\frac{4}{3}$ cm. The perimeter of the triangle is $4\frac{2}{15}$ cm. What is the length of either of the remaining equal sides?

Sol. Let the equal sides be x

Perimeter of isosceles triangle = Sum of all sides

$$4\frac{2}{15} = \frac{4}{3} + x + x$$

$$\frac{62}{15} = \frac{4}{3} + 2x$$

$$\frac{62}{15} - \frac{4}{3} = 2x$$

$$\frac{62}{15} - \frac{4}{3} \times \frac{5}{5} = 2x$$

$$\frac{62}{15} - \frac{20}{15} = 2x$$

$$\frac{62-20}{15} = 2x$$

$$\frac{42}{15} = 2x$$

$$\frac{42}{15} \times \frac{1}{2} = x$$

$$\boxed{\frac{7}{5} = x}$$

Therefore, the equal sides are $\frac{7}{5}, \frac{7}{5}$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Sum of two numbers is 95. If one exceeds the other by 15. Find the numbers.

Sol. Let the one number be x
Then the other number be $x+15$

According to question (Atq.)

$$x + x + 15 = 95$$

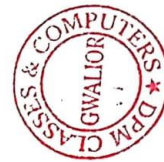
$$2x + 15 = 95$$

$$2x = 95 - 15$$

$$2x = 80$$

$$x = \frac{80}{2}$$

$$x = 40$$



Therefore, one number is 40

and other number is $40 + 15 = 55$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Two numbers are in the ratio 5:3. If they differ by 18. What are the numbers?

Sol. given ratio = 5:3.

Let the first number is $5x$
the second number is $3x$

Atq

$$5x - 3x = 18$$

$$2x = 18$$

$$x = \frac{18}{2}$$

$$\boxed{x = 9}$$



Therefore, the first number is $= 5 \times 9 = 45$

the second number is $= 3 \times 9 = 27$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Three consecutive integers add up to 51, what are these integers?

Sol. Let three consecutive numbers are $x, x+1, x+2$

Ans

$$x + x+1 + x+2 = 51$$

$$3x + 3 = 51$$

$$3x = 51 - 3$$

$$3x = 48$$

$$x = \frac{48}{3}$$

$$\boxed{x = 16}$$



Therefore, numbers are -

$$x = 16$$

$$x+1 = 16+1 = 17$$

$$x+2 = 16+2 = 18$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The sum of three consecutive multiples of 8 is 888.
Find the multiples.

Sol. Let the three consecutive multiples of 8 be

$$8x, 8(x+1), 8(x+2)$$

Sum of these numbers —

$$8x + 8(x+1) + 8(x+2) = 888$$

$$8x + 8x + 8 + 8x + 16 = 888$$

$$24x + 24 = 888$$

$$24x = 888 - 24$$

$$24x = 864$$

$$x = \frac{864}{24}$$

$$\boxed{x = 36}$$



$$\frac{864}{24} = \frac{108 \times 8}{3 \times 8}$$

$$= \frac{108}{3}$$

$$= 36$$



$$\text{First multiple} = 8x = 8 \times 36 = 288$$

$$\text{Second multiple} = 8x + 8 = 288 + 8 = 296$$

$$\text{Third multiple} = 8x + 16 = 288 + 16 = 304$$

Therefore, the required numbers are 288, 296 and 304

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively, they add up to 74. Find these numbers.

Sol. Let the three consecutive numbers are $x, x+1, x+2$

Ans $x + x+1 + x+2$ (Three consecutive numbers)

$$2(x) + 3(x+1) + 4(x+2) = 74$$

$$2x + 3x + 3 + 4x + 8 = 74$$

$$9x + 11 = 74$$

$$9x = 74 - 11$$

$$9x = 63$$

$$x = \frac{63}{9}$$

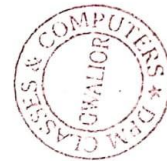
$$x = 7$$

$$x = 7$$

$$x+1 = 7+1 = 8$$

$$x+2 = 7+2 = 9$$

Hence, the numbers are 7, 8, 9



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The ages of Rahul and Haroon are in the ratio 5:7.
Four years later the sum of their ages will be 56 years.
What are their present ages?

Sol. Let the present age of Rahul = $5x$ yrs
and the present age of Haroon = $7x$ yrs

Atq : After four years -

$$\text{Rahul's age} = (5x+4) \text{ yrs}$$

$$\text{Haroon's age} = (7x+4) \text{ yrs}$$

Again Atq,

$$(5x+4) + (7x+4) = 56$$

$$5x+4 + 7x+4 = 56$$

$$12x+8 = 56$$

$$12x = 56-8$$

$$12x = 48$$

$$x = \frac{48}{12}$$

$$\boxed{x = 4}$$

Therefore, the present age of Rahul = $5 \times 4 = 20$ yrs

and the present age of Haroon = $7 \times 4 = 28$ yrs



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The number of boys and girls in a class are in the ratio 7:5. The number of boys is 8 more than the number of girls. What is the total class strength?

Sol. Let the number of girls be = x
and the number of boys be = $(x+8)$

$$\text{ratio} = \frac{\text{Number of boys}}{\text{Number of girls}}$$

$$\frac{7}{5} = \frac{x+8}{x}$$

$$7x = 5x + 40$$

$$7x - 5x = 40$$

$$2x = 40$$

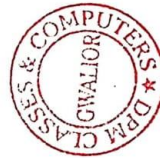
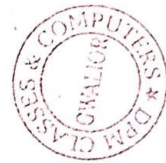
$$x = \frac{40}{2}$$

$$\boxed{x = 20}$$

Therefore, the number of girls = 20

and the number of boys = $20+8 = 28$

Hence, Total strength of the class = $20+28 = 48$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Baichung's father is 26 years younger than Baichung's grandfather and 29 years older than Baichung. The sum of the ages of all the three is 135 years. What is the age of each one of them?

Sol. Let the Baichung's father's age = x yrs
 then Baichung's age = $(x-29)$ yrs
 then Baichung's grandfather's age = $(x+26)$ yrs.

Ans

$$(x-29) + x + (x+26) = 135$$

$$x - 29 + x + x + 26 = 135$$

$$3x - 3 = 135$$

$$3x = 135 + 3$$

$$3x = 138$$

$$x = \frac{138}{3}$$

$$\boxed{x = 46}$$



therefore, The Baichung's age = $x - 29$
 $= 46 - 29 = 17$ yrs

the Baichung's father's age = 46 yrs

The Baichung's grandfather's age = $46 + 26$
 $= 72$ yrs

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Fifteen years from now Ravi's age will be four times his present age. What is Ravi's present age?

Sol. Let the Ravi's present age = x yrs

Ans. fifteen years from now

Ravi's age = $(x+15)$ yrs

$$(x+15) = 4x$$

$$x+15 = 4x$$

$$15 = 4x - x$$

$$15 = 3x$$

$$\frac{15}{3} = x$$

$$5 = x$$

Therefore, the present age of Ravi is 5 years.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. A rational number is such that when you multiply it by $\frac{5}{2}$ and add $\frac{2}{3}$ to the product, you get $-\frac{7}{12}$. What is the number?

Sol. Let the rational number is x

Ans

$$x \times \frac{5}{2} + \frac{2}{3} = -\frac{7}{12}$$

$$\frac{5x}{2} + \frac{2}{3} = -\frac{7}{12}$$

$$\frac{5x}{2} = -\frac{7}{12} - \frac{2}{3}$$

$$\frac{5x}{2} = -\frac{7}{12} - \frac{2}{3} \times \frac{4}{4}$$

$$\frac{5x}{2} = -\frac{7}{12} - \frac{8}{12}$$

$$\frac{5x}{2} = \frac{-7-8}{12}$$

$$\frac{5x}{2} = \frac{-15}{12}$$

$$x = \frac{-15}{12} \times \frac{2}{5}$$

$$x = -\frac{3}{4}$$

Therefore, rational no. is $-\frac{3}{4}$



$$\frac{-15}{12} \times \frac{2}{5}$$

$$-\frac{3}{4}$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Laxmi is a cashier in a bank. She has currency notes of denominations ₹100, ₹50 and ₹10, respectively. The ratio of the number of these notes is 2:3:5. The total cash with Laxmi is ₹4,00,000. How many notes of each denomination does she have?

Sol. Let the number of notes ₹100 = $2x$
the number of notes ₹50 = $3x$
the number of notes ₹10 = $5x$



$$\text{Amount of ₹100 notes} = 100 \times 2x = ₹200x$$

$$\text{Amount of ₹50 notes} = 50 \times 3x = ₹150x$$

$$\text{Amount of ₹10 notes} = 10 \times 5x = ₹50x$$

Atq

$$200x + 150x + 50x = 4,00,000$$

$$400x = 4,00,000$$

$$x = \frac{4,00,000}{400}$$

$$x = 1000$$



$$\text{Therefore, the number of notes ₹100} = 2 \times 1000 = 2000$$

$$\text{the number of notes ₹50} = 3 \times 1000 = 3000$$

$$\text{the number of notes ₹10} = 5 \times 1000 = 5000$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. I have a total of ₹ 300 in coins of denomination ₹ 1, ₹ 2, and ₹ 5. The number of ₹ 2 coins is 3 times the number of ₹ 5 coins. The total number of coins is 160. How many coins of each denomination are with me?

Sol. Let the no. of coins ₹ 5 = x

the no. of coins ₹ 2 = 3 times of ₹ 5 coins
= $3x$

The no. of coins ₹ 1 = $160 - 3x - x$
= $160 - 4x$

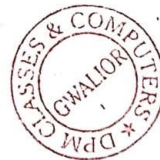


Amount of ₹ 1 coins = $1 \times (160 - 4x) = (160 - 4x)$

Amount of ₹ 2 coins = $2 \times 3x = 6x$

Amount of ₹ 5 coins = $5 \times x = 5x$

$$(160 - 4x) + 6x + 5x = 300$$



$$160 + 7x = 300$$

$$7x = 300 - 160$$

$$7x = 140$$

$$x = \frac{140}{7}$$

$$x = 20$$

Therefore,

no. of coins ₹ 5 = 20

no. of coins ₹ 2 = $3 \times 20 = 60$

no. of coins ₹ 1 = $160 - 4 \times 20$
= $160 - 80 = 80$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The organisers of an essay competition decide that a winner in the competition gets a prize of ₹ 100 and a participant who does not win gets a prize of ₹ 25. The total prize money distributed is ₹ 3,000. Find the number of winners, if the total number of participants is 63.



Sol. Let the no. of winners be x

the no. of participants be $= 63 - x$

Amount given to the winners $= 100 \times x = 100x$

Amount given to the participants $= [25 \times (63 - x)]$
 $= 1575 - 25x$

$$100x + 1575 - 25x = 3000$$

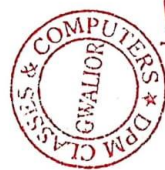
$$75x + 1575 = 3000$$

$$75x = 3000 - 1575$$

$$75x = 1425$$

$$x = \frac{1425}{75}$$

$$\boxed{x = 19}$$



$$\frac{1425}{75} = \frac{57 \times 25}{3 \times 25}$$

$$= \frac{57}{3}$$

$$= 19$$

Therefore, the number of winners $= 19$.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Solve the following equations and check your results:

1. $3x = 2x + 18$

check: $3x = 2x + 18$

Sol. $3x = 2x + 18$

$3 \times 18 = 2 \times 18 + 18$

$3x - 2x = 18$

$54 = 36 + 18$

$x = 18$

$54 = 54$ checked.

2. $5t - 3 = 3t - 5$

check: $5t - 3 = 3t - 5$

Sol. $5t - 3 = 3t - 5$

$5x - 1 - 3 = 3x - 1 - 5$

$5t - 3t = -5 + 3$

$-5 - 3 = -3 - 5$

$2t = -2$

$t = \frac{-2}{2}$

$t = -1$

$-8 = -8$ checked.



3. $5x + 9 = 5 + 3x$

check: $5x + 9 = 5 + 3x$

Sol. $5x + 9 = 5 + 3x$

$5x - 2 + 9 = 5 + 3x - 2$

$5x - 3x = 5 - 9$

$-10 + 9 = 5 - 6$

$2x = -4$

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

$x = -2$

$-1 = -1$ checked.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. $4z + 3 = 6 + 2z$

checked: $4z + 3 = 6 + 2z$

Sol. $4z + 3 = 6 + 2z$

$4 \times \frac{3}{2} + 3 = 6 + 2 \times \frac{3}{2}$

$4z - 2z = 6 - 3$

$2 \times 3 + 3 = 6 + 1 \times 3$

$2z = 3$

$6 + 3 = 6 + 3$

$$z = \frac{3}{2}$$



$$9 = 9 \text{ checked.}$$

5. $2x - 1 = 14 - x$

check: $2x - 1 = 14 - x$

Sol. $2x - 1 = 14 - x$

$2 \times 5 - 1 = 14 - 5$

$2x + x = 14 + 1$

$10 - 1 = 9$

$3x = 15$

$$9 = 9 \text{ checked.}$$

$x = \frac{15}{3}$



$$x = 5$$

6. $8x + 4 = 3(x - 1) + 7$ check: $8x + 4 = 3(x - 1) + 7$

Sol. $8x + 4 = 3x - 3 + 7$

$8 \times 0 + 4 = 3(0 - 1) + 7$

$8x - 3x = 4 - 4$

$0 + 4 = -3 + 7$

$5x = 0$

$$4 = 4 \text{ checked.}$$

$x = \frac{0}{5}$

$$x = 0$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$\text{Q. } x = \frac{4}{5} (x+10) \quad \text{check: } x = \frac{4}{5} (x+10)$$

$$\text{Sol. } x = \frac{4}{5} (x+10) \quad 40 = \frac{4}{5} (40+10)$$

$$5x = 4x + 40$$

$$40 = \frac{4}{5} \times 50$$

$$5x - 4x = 40$$

$$40 = 4 \times 10$$

$$\boxed{x = 40}$$

$$\boxed{40 = 40} \text{ checked.}$$

$$\text{Q. } \frac{2x}{3} + 1 = \frac{7x}{15} + 3 \quad \text{check: } \frac{2x}{3} + 1 = \frac{7x}{15} + 3$$

$$\text{Sol. } \frac{2x}{3} + 1 = \frac{7x}{15} + 3 \quad \frac{2 \times 10}{3} + 1 = \frac{7 \times 10}{15} + 3$$

$$\frac{2x}{3} \times \frac{5}{5} - \frac{7x}{15} = 3 - 1$$

$$\frac{20}{3} + 1 \times \frac{3}{3} = \frac{70}{15} + 3 \times \frac{15}{15}$$

$$\frac{10x}{15} - \frac{7x}{15} = 2$$



$$\frac{20}{3} + \frac{3}{3} = \frac{70}{15} + \frac{45}{15}$$

$$\frac{10x - 7x}{15} = 2$$

$$\frac{20 + 3}{3} = \frac{70 + 45}{15}$$

$$\frac{3x}{15} = 2$$

$$\frac{23}{3} = \frac{115}{15}$$

$$x = 2 \times \frac{15}{3}$$

$$\boxed{\frac{23}{3} = \frac{23}{3}} \text{ checked.}$$

$$x = 2 \times 5$$

$$\boxed{x = 10}$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$Q. 2y + \frac{5}{3} = \frac{26}{3} - y$$

$$\text{check: } 2y + \frac{5}{3} = \frac{26}{3} - y$$

$$\text{Sol. } 2y + \frac{5}{3} = \frac{26}{3} - y$$

$$2 \times \frac{7}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3}$$

$$2y + y = \frac{26}{3} - \frac{5}{3}$$

$$\frac{14}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3}$$

$$3y = \frac{26-5}{3}$$

$$\frac{14+5}{3} = \frac{26-7}{3}$$

$$3y = \frac{21}{3}$$



$$\boxed{\frac{19}{3} = \frac{19}{3}}$$

$$3y = 7$$

checked.

$$\boxed{y = \frac{7}{3}}$$

$$10. 3m = 5m - \frac{8}{5}$$

$$\text{check: } 3m = 5m - \frac{8}{5}$$

$$\text{Sol. } 3m - 5m = -\frac{8}{5}$$



$$3 \times \frac{4}{5} = 5 \times \frac{4}{5} - \frac{8}{5}$$

$$-2m = -\frac{8}{5}$$

$$\frac{12}{5} = \frac{20}{5} - \frac{8}{5}$$

$$m = \frac{-8}{5} \times \frac{-1}{2}$$

$$\boxed{\frac{12}{5} = \frac{12}{5}}$$

checked.

$$\boxed{m = \frac{4}{5}}$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Aring thinks of a number and subtracts $\frac{5}{2}$ from it. She multiplies the result by 8. The result now obtained is 3 times the same number she thought of. What is the number?

sol. Let the number be x

$$\left(x - \frac{5}{2}\right) \times 8 = 3(x)$$

$$8x - \frac{5}{2} \times 8 = 3x$$

$$8x - 5 \times 4 = 3x$$

$$8x - 3x = 20$$

$$5x = 20$$

$$x = \frac{20}{5}$$

$$\boxed{x = 4}$$

Hence, the number is 4.



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. A positive number is 5 times another number. If 21 is added to both the numbers, then one of the new numbers becomes twice the other new number. What are the numbers?

Sol. Let the another no. is x
then first no. is $5x$



Atq

$$2(x + 21) = 5x + 21$$

$$2x + 42 = 5x + 21$$

$$2x - 5x = 21 - 42$$

$$-3x = -21$$

$$x = \frac{-21}{-3}$$

$$\boxed{x = 7}$$



Hence, the another no. is 7

the first no is $5 \times 7 = 35$

Therefore, the numbers are 7 and 35 respectively.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Sum of the digits of a two-digit number is 9. When we interchange the digits, it is found that the resulting new number is greater than the original number by 27. What is the two-digit number?

Sol. Let one digit be x
Tens digit $(9-x)$



$$\begin{aligned}\text{then the original number} &= (9-x) \times 10 + (x) \times 1 \\ &= 90 - 10x + x \\ &= 90 - 9x\end{aligned}$$

Interchange digit,
one digit $= (9-x)$
Tens digit $= x$



$$\begin{aligned}\text{then the new number} &= (x) \times 10 + (9-x) \times 1 \\ &= 10x + 9 - x \\ &= 9x + 9\end{aligned}$$

$$\text{New number} = \text{original number} + 27$$

$$9x + 9 = 90 - 9x + 27 \quad \left| \quad x = \frac{126}{18}$$

$$9x + 9x = 90 + 27 - 9 \quad \left| \quad = 7$$

$$18x = 126$$

$$\begin{aligned}\text{Hence no is } &90 - 9 \times 7 \\ &90 - 63 \\ &27 \text{ or } 72\end{aligned}$$

51.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. One of the two digits of a two digit number is three times the other digit. If you interchange the digits of this two-digit number and add the resulting number to the original number, you get 88. What is the original number?

Sol. Let's one's digit = x

Tens digit = $3x$

$$\begin{aligned}\text{the original number} &= 3x \times 10 + x \times 1 \\ &= 30x + x \\ &= 31x\end{aligned}$$



Interchange digits

one's digit = $3x$, Tens digit = x

$$\begin{aligned}\text{the new number} &= x \times 10 + 3x \times 1 \\ &= 10x + 3x \\ &= 13x\end{aligned}$$



$$\text{original number} + \text{New number} = 88$$

$$31x + 13x = 88$$

$$44x = 88$$

$$x = \frac{88}{44}$$

$$\boxed{x = 2}$$

therefore number is

$$= 31 \times 2$$

$$= 62 \text{ or } 26$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Shobo's mother's present age is six times Shobo's present age. Shobo's age five years from now will be one third of his mother's present age. What are their present ages?

Sol. Let the Shobo's present age = x years
 then the Shobo's mother's present age = $6x$ years

Atq five years from now:

$$\text{Shobo's age} = (x+5) \text{ yrs}$$

$$\text{mother's age} = (6x) \text{ yrs}$$

$$x+5 = (6x) \times \frac{1}{3}$$

$$x+5 = \frac{6x}{3}$$

$$x+5 = 2x$$

$$5 = 2x - x$$

$$\boxed{5 = x}$$

Therefore, Shobo's present age is 5 years

Shobo's mother's present age is $6 \times 5 = 30$ years.



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. There is a narrow rectangular plot, reserved for a school, in mahuli village. The length and breadth of the plot are in the ratio 11:4. At the rate ₹ 100 per metre it will cost the village panchayat ₹ 75000 to fence the plot. What are the dimensions of the plot?

Sol. Let the length be $(11x)$ m
the breadth be $(4x)$ m



$$\begin{aligned}\text{Perimeter of rectangular plot} &= 2(l+b) \\ &= 2(11x+4x) \\ &= 2(15x) \\ &= 30x\end{aligned}$$

$$\text{Cost of 1 m fencing} = ₹ 100$$

$$\begin{aligned}\text{Cost of } 30x \text{ fencing} &= ₹ 100 \times 30x \\ &= ₹ 3000x\end{aligned}$$

$$\text{given cost of fencing} = ₹ 75000$$



Comparison both

$$3000x = 75000$$

$$x = \frac{75000}{3000}$$

$$\boxed{x = 25}$$

$$\text{Therefore length} = 11 \times 25 = 275 \text{ m}$$

$$\text{breadth} = 4 \times 25 = 100 \text{ m}$$

Hence, dimension is 275×100

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Hasan buys two kinds of cloth materials for school uniforms, shirt material that costs him ₹ 50 per metre and trouser material that costs him ₹ 90 per metre. For every 3 metres of the shirt material he buys 2 metres of the trouser material. He sells the materials at 12% and 10% profit respectively. His total sale is ₹ 36,600. How much trouser material did he buy?

Sol. Let trouser material bought = $2x$ m
 shirt material bought = $3x$ m



$$\begin{aligned}
 \text{Selling price of 1m trouser material} &= 90 + 12\% \text{ of } 90 \\
 &= 90 + \frac{12}{100} \times 90 \\
 &= 90 + 10.80 \\
 &= ₹ 100.80
 \end{aligned}$$



$$\begin{aligned}
 \text{Selling price of 1m shirt material} &= 50 + 10\% \text{ of } 50 \\
 &= 50 + \frac{10}{100} \times 50 \\
 &= 50 + 5 \\
 &= ₹ 55
 \end{aligned}$$

$$\text{Total selling amount} = ₹ 36,600$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$100.80 \times (2x) + 55 \times (3x) = 36660$$

$$201.60x + 165x = 36660$$

$$366.60x = 36660$$

$$x = \frac{36660}{366.60}$$

$$x = \frac{36660}{366.60} \times 100$$

$$x = 100$$



$$\begin{aligned} \text{Tracer material} &= 2 \times x \\ &= 2 \times 100 \\ &= 200 \text{ m} \end{aligned}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Half of a herd of deer are grazing in the field and three fourths of the remaining are playing nearby. the rest 9 are drinking water from the pond. Find the number of deer in the herd.

Sol. Let the number of deer be x

$$\text{Number of deer grazing in the field} = \frac{x}{2}$$

$$\text{Number of deer playing nearby} = \frac{3}{4} \times \text{No. of remaining deer}$$

$$= \frac{3}{4} \times \left(x - \frac{x}{2}\right)$$

$$= \frac{3}{4} \times \left(\frac{2x - x}{2}\right)$$

$$= \frac{3}{4} \times \frac{x}{2}$$

$$= \frac{3x}{8}$$

$$\text{No. of deer drinking water from the pond} = 9$$

$$x - \left(\frac{x}{2} + \frac{3x}{8}\right) = 9$$

$$x - \left(\frac{4x + 3x}{8}\right) = 9$$

$$x - \frac{7x}{8} = 9$$

$$\frac{8x - 7x}{8} = 9$$

$$\frac{x}{8} = 9$$

$$x = 9 \times 8$$

$$x = 72$$

Hence, the total number of deer in the herd is 72.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q.. A grandfather is ten-times older than his granddaughter. He is also 54 years older than her. Find their present ages.

Sol. Let the present age of granddaughter = x years
then the present age of grandfather = $10x$ years

Atq, Compare ages -

$$54 + x = 10x$$

$$54 = 10x - x$$

$$54 = 9x$$

$$\frac{54}{9} = x$$

$$\boxed{6 = x}$$



Therefore, the present age of granddaughter = 6 yrs

the present age of grandfather = $10 \times 6 = 60$ yrs.

Q. Aman's age is three times his son's age. Ten years ago he was five times his son's age. Find their present ages.

Sol. [do it self]

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. Solve the following linear equations :-

1. $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$

Sol. $\frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$



$$\frac{x}{2} - \frac{x}{3} = \frac{1}{4} + \frac{1}{5}$$

$$\frac{x}{2} \times \frac{3}{3} - \frac{x}{3} \times \frac{2}{2} = \frac{1}{4} \times \frac{5}{5} + \frac{1}{5} \times \frac{4}{4} \quad (\text{Base same})$$

$$\frac{3x}{6} - \frac{2x}{6} = \frac{5}{20} + \frac{4}{20}$$

$$\frac{3x - 2x}{6} = \frac{5 + 4}{20}$$

$$\frac{x}{6} = \frac{9}{20} \quad (\text{Cross multiplication})$$

$$x \times 20 = 9 \times 6$$

$$x = \frac{9 \times 6}{20}$$

$$x = \frac{27}{10}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$\textcircled{2}. \quad \frac{n}{2} - \frac{3n}{4} + \frac{5n}{6} = 21$$

$$\frac{n}{2} \times \frac{6}{6} - \frac{3n}{4} \times \frac{3}{3} + \frac{5n}{6} \times \frac{2}{2} = 21$$

$$\frac{6n}{12} - \frac{9n}{12} + \frac{10n}{12} = 21$$

$$\frac{6n - 9n + 10n}{12} = 21$$

$$\frac{16n - 9n}{12} = 21$$

$$\frac{7n}{12} = 21$$

$$n = \frac{21 \times 12}{7}$$

$$n = 3 \times 12$$

$$\boxed{n = 36}$$

$$\begin{array}{r|l} 2 & 2, 4, 6 \\ \hline 2 & 1, 2, 3 \\ 3 & 1, 1, 3 \\ \hline & 1, 1, 1 \end{array}$$

$$\begin{aligned} \text{LCM} &= 2 \times 2 \times 3 \\ &= 12 \end{aligned}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$\textcircled{Q}. \quad x+7-\frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$$

$$\text{Sol.} \quad \frac{x}{1} - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - \frac{7}{1}$$

$$\frac{x}{1} \times \frac{6}{6} - \frac{8x}{3} \times \frac{2}{2} + \frac{5x}{2} \times \frac{3}{3} = \frac{17}{6} - \frac{7}{1} \times \frac{6}{6}$$

$$\frac{6x}{6} - \frac{16x}{6} + \frac{15x}{6} = \frac{17}{6} - \frac{42}{6}$$

$$\frac{6x-16x+15x}{6} = \frac{17-42}{6}$$

$$21x-16x = -25$$

$$5x = -25$$

$$x = \frac{-25}{5}$$

$$\boxed{x = -5}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$\text{Q. } \frac{x-5}{3} = \frac{x-3}{5}$$

$$\text{Solve: } 5(x-5) = 3(x-3)$$

$$5x - 25 = 3x - 9$$

$$5x - 3x = -9 + 25$$

$$2x = 16$$

$$x = \frac{16}{2}$$

$$\boxed{x = 8}$$



$$\text{Q. } \frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$$

$$\text{Sol. } \frac{3(3t-2)}{3 \times 4} - \frac{(2t+3) \times 4}{3 \times 4} = \frac{2}{3} - t \times \frac{3}{3}$$

$$\frac{9t-6}{12} - \frac{8t-12}{12} = \frac{2}{3} - \frac{3t}{3}$$



$$\frac{9t-6-8t-12}{12} = \frac{2-3t}{3}$$

$$\frac{t-18}{12} = \frac{2-3t}{3}$$

$$t-18 = 4(2-3t)$$

$$t-18 = 8-12t$$

$$t+12t = 8+18$$

$$13t = 26$$

$$t = \frac{26}{13}$$

$$\boxed{t = 2}$$

62.

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$Q. \quad m - \frac{m-1}{2} = 1 - \frac{m-2}{3}$$

$$Sol. \quad m - \frac{(m-1)}{2} = 1 - \frac{(m-2)}{3}$$

$$\frac{2 \times m}{2} - \frac{(m-1)}{2} = 1 \times \frac{3}{3} - \frac{(m-2)}{3}$$

$$\frac{2m - m + 1}{2} = \frac{3 - m + 2}{3}$$



$$\frac{m+1}{2} = \frac{5-m}{3} \quad (\text{Cross multiplication})$$

$$3(m+1) = 2(5-m)$$

$$3m+3 = 10-2m$$

$$3m+2m = 10-3$$

$$5m = 7$$

$$m = \frac{7}{5}$$



$$Q. \quad 3(t-3) = 5(2t+1)$$

$$Sol. \quad 3t-9 = 10t+5$$

$$3t-10t = 5+9$$

$$-7t = 14$$

$$t = \frac{14}{-7}$$

$$t = -2$$

DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$Q. 15(y-4) - 2(y-9) + 5(y+6) = 0$$

$$Sol. 15y - 60 - 2y + 18 + 5y + 30 = 0$$

$$15y - 2y + 5y - 60 + 18 + 30 = 0$$

$$20y - 2y - 60 + 48 = 0$$

$$18y - 12 = 0$$

$$18y = 12$$

$$y = \frac{12}{18}$$

$$\boxed{y = \frac{2}{3}}$$



$$Q. 3(5z-7) - 2(9z-11) = 4(8z-13) - 17$$

$$Sol. 15z - 21 - 18z + 22 = 32z - 52 - 17$$

$$15z - 18z - 21 + 22 = 32z - 52 - 17$$

$$-3z + 1 = 32z - 69$$

$$-3z - 32z = -69 - 1$$

$$-35z = -70$$

$$z = \frac{-70}{-35}$$

$$\boxed{z = 2}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$Q. \quad 0.25(4f-3) = 0.05(10f-9)$$

$$Sol. \quad 0.25 \times 4f + 0.25 \times -3 = 0.05 \times 10f + 0.05 \times -9$$

$$1.00f - 0.75 = 0.50f - 0.45$$

$$1.00f - 0.50f = -0.45 + 0.75$$

$$0.50f = 0.25$$

$$f = \frac{0.25}{0.50}$$

$$f = \frac{25}{502}$$

$$\boxed{f = \frac{1}{2}}$$



$$Q. \quad \frac{8x-3}{3x} = \frac{2}{1}$$

$$Sol. \quad 8x-3 = 2 \times 3x$$

$$8x-3 = 6x$$

$$8x-6x = 3$$

$$2x = 3$$

$$\boxed{x = \frac{3}{2}}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$Q. \frac{9x}{7-6x} = 15$$

$$Sol. \frac{9x}{7-6x} = \frac{15}{1}$$

$$9x = 15(7-6x)$$

$$9x = 105 - 90x$$

$$9x + 90x = 105$$

$$99x = 105$$

$$x = \frac{105}{99} \frac{35}{33}$$

$$\boxed{x = \frac{35}{33}}$$



$$Q. \frac{z}{z+15} = \frac{4}{9}$$

$$Sol. 9z = 4(z+15)$$

$$9z = 4z + 60$$

$$9z - 4z = 60$$

$$5z = 60$$

$$z = \frac{60}{5}$$

$$\boxed{z = 12}$$



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

$$\text{Q. } \frac{3y+4}{2-6y} = -\frac{2}{5}$$

$$\text{Sol. } 5(3y+4) = -2(2-6y)$$

$$15y + 20 = -4 + 12y$$

$$15y - 12y = -4 - 20$$

$$3y = -24$$

$$y = -\frac{24}{3}$$

$$\boxed{y = -8}$$

$$\text{Q. } \frac{7y+4}{y+2} = -\frac{4}{3}$$

$$\text{Sol. } 3(7y+4) = -4(y+2)$$

$$21y + 12 = -4y - 8$$

$$21y + 4y = -8 - 12$$

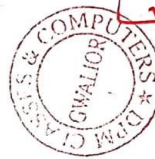
$$25y = -20$$

$$y = -\frac{20}{25}$$

$$\boxed{y = -\frac{4}{5}}$$

Sol.

[do it self]



8. The denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1, the number obtained is $\frac{3}{2}$. Find the rational number?



DPM CLASSES

6th to 10th (Math's & Science), 11th & 12th (Physics, Chemistry, Math's)

Q. The ages of Hari and Harry are in the ratio 5:7. Four years from now the ratio of their ages will be 3:4. Find their present ages.

Sol. Let the Hari present age = $5x$ years
the Harry present age = $7x$ years

After Four years -

$$\text{Hari's age} = (5x+4) \text{ yrs}$$

$$\text{Harry's age} = (7x+4) \text{ yrs}$$

$$\frac{5x+4}{7x+4} = \frac{3}{4}$$

$$4(5x+4) = 3(7x+4)$$

$$20x+16 = 21x+12$$

$$20x - 21x = 12 - 16$$

$$-x = -4$$

$$\boxed{x = 4}$$

Therefore, Hari's present age = $5 \times 4 = 20$ yrs

Harry's present age = $7 \times 4 = 28$ yrs.

