# Talent & Olympiad

## **Simple Equations**

#### **Multiple Choice Questions**

**1.** what is the value of 'x' in

$$\frac{3x-1}{5} - \frac{1+x}{2} = 3 - \frac{x-1}{2}?$$
(a) 5 (b) -7
(c) 7 (d) -5

- 2. If 0.2(2x-1) 0.5(3x-1) = 0.4, what is the value of x'?
  - (a)  $\frac{1}{11}$  (b)  $-\frac{1}{11}$ (c)  $\frac{3}{11}$  (d)  $-\frac{3}{11}$
- **3.** In each of these figures the solution of an equation is given in brackets. Which of them is correct?



**4.** Sunil wrote an equation as  $\frac{m}{5} = 4$ .

Ravi wrote a statement for Sunil's equation.

Which of these is the statement of Ravi if he has written correctly?

- (a) One-fifth of m' is 4.
- (b) One-fifth of a number is 5.
- (c) One-fourth of 'm' is 4.
- (d) One-fourth of a number is 4.

5. In which of the following cases does an equality NOT hold?

(a) Adding the same number on both the sides.

(b) Not performing the same operation on both the sides.

(c) Subtracting the same number from both the sides.

(d) Multiplying both the sides by the same nonzero number.

6. What are the two steps involved in solving the equation 15x + 4 = 26?

(a) Subtracting 4 from both the sides and then dividing both sides by 15.

(b) Adding 4 on both sides & then multiplying both sides by 15.

(c) Subtracting 4 on the L.H.S. and multiplying by 15 on the R.H.S.

(d) Adding 4 on the L.H.S. and dividing by 15 on the R.H.S.

**7.** Which of the following equations can be constructed with x = 2?

(a) $3x + 4 = 8$	(b) $3x - 4 = 2$
(c) $3x + 4 = 2$	(d) $3x - 4 = 8$

**8.** 7 subtracted from  $\frac{5}{2}$  of a number results in 23.

What is the number?

(a) -10 (b) 10 (c) 12 (d) -12

**9.** In a coconut grove, (x + 2) trees yield 60 coconuts per year, x trees yield 120 coconuts per

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year and (x-2) trees yield 180 coconuts per year. If the average yield per year per tree is 100, find x.

(a) 4	(b)	3
(c) 2	(d)	1

**10.** 4 is added to a number and the sum is multiplied by 5. If 20 is subtracted from the product and the difference is divided by 8, the result is equal to 10.

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(a) 16	(b) 12
(c) 8	(d) 20

Find the number

**11.** A number is 3 less than two times the other. If their sum is increased by 7, the result is 37. Find the numbers.

(a) 9,11	(b) 11, 13
(c) 11, 19	(d) 9,13

- **12.**  $\frac{1}{2}$  is subtracted from a number and the difference is multiplied by 4. If 25 is added to the product and the sum is divided by 3, the result is equal to 10. Find the number.
  - (a)  $\frac{3}{5}$  (b)  $\frac{7}{4}$ (c)  $\frac{6}{7}$  (d)  $\frac{2}{3}$
- **13.** The present age of A is twice that of B. 30 years from now, age of A will be  $1\frac{1}{2}$  times that of B. Find the present ages (in years) of A and B respectively.

(a) 60, 30	(b) 30, 60
(c) 40, 50	(d) 50, 40

- 14. A person travelled  $\frac{5}{8}^{th}$  of the distance by train,  $\frac{1}{4}^{th}$  by bus and the remaining 15 km by boat. Find the total distance travelled by him. (a) 90 km (b) 120 km (c) 150 km (d) 180 km
- **15.** The total cost of three prizes is Rs.2550. If the value of second prize is  $\frac{3}{4}^{th}$  of the first and the value of 3rd prize is  $\frac{1}{2}$  of the second prize, find the value of first prize. (a) *Rs*.900 (b) *Rs*.1500

(c) Rs.1200	(d) <i>Rs</i> .450
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16. Which of the following is an equation? (a) 4x+5=65 (b) 4x+5<65(c) 4x+5>65 (d)  $4x+5\neq 65$ 

- 17. Which of the following is an algebraic expression for the statement "The sum of 3x and 11 is 32."? (a) 11x + 3 = 32 (b) 3x + 11 = 32(c) 3x + 32 = 11 (d) 11x + 32 = 11
- **18.** Choose the statement that best describes the equation  $\frac{1}{4}m = 10$ .
  - (a) One fourth of 10 is m.
  - (b) One fourth of m is 3 more than 3.
  - (c) One fourth of m is 10.
  - (d) Four times m is 10.
- 19. Vinay's father is 44 years old. If he is 5 years older than thrice Vinay's age, which of these equations gives, the age of Vinay's father?

- (a) 3x+5=44 (b) 44+5x=3x(c) 44-3y=5+3y (d) 3x-5=44
- **20.** Which of the following statements is false? (a) The solution of 4x = 60 is 12.
  - (b) y = 7 satisfies the equation y + 0 = 7.
  - (c)  $p = \frac{5}{2}$  is the solution of 12p 5 = 25. (d)  $m = \frac{3}{2}$  is the solution of 4(m+3) = 18.
- **21.** Which of the following does not affect the given equation?

(a) Adding 0 on the L.H.S. and 1 on the R. H. S.(b) Adding 1 on the L.H.S. and (-1) on the R.H.S.

(c) Adding the same number on both sides of the equation.

(d) Adding 0 on the R.H.S. and 1 on the L.H.S.

**22.** P is a linear equation. How many solutions does P have?

(a) 1	(b) 0
(c) 3	(d) Infinitely many

23. Ramesh got 5 marks more than Sonu in a test. If the total marks secured by them is 15, how many marks did Ramesh get?

(a) 25	(b) 5
(c) 15	(d) 10

- **24.** In a test match, Sach in scored twice as many runs as Sehwag. Together, their runs fell two short of a double century. How many runs did Sachin score?
  - (a) 66 (b) 132
  - (c) 198 (d) 200

25. In a math test, the highest marks obtained by a student in the class is twice the lowest marks plus 7. If the highest score is 87, what is the lowest score?

26. A teacher asks the students of her class to write an equation for the statement "Ten times a number p is 100." Three students wrote the following equations. Which is correct?

(i) 
$$10 p = 100$$
  
(ii)  $\frac{10}{p} = 100$   
(iii)  $\frac{10p}{p} = 100$ 

(a) (i) only	(b) (ii) only
(c) (iii) only	(d) Both (B) and (C).

**27.** On transposing terms from one side of the equation to the otner, which of these changes takes place?

(a) Addition becomes subtraction.

- (b) Multiplication becomes addition.
- (c) Addition becomes multiplication.
- (d) Multiplication becomes subtraction.

**28.** 
$$M = \frac{2x+5}{7}$$
 and  $N = \frac{3x-2}{4}$ . What value of x makes  $M = N$ ?

(a) 
$$\frac{-17}{3}$$
 (b)  $\frac{-34}{13}$   
(c)  $\frac{34}{13}$  (d)  $\frac{17}{3}$ 

**29.** Given A = P(1 + rt), what is the value of 'r' when A = 27, P = 18 and t = 5?

(a) 
$$\frac{1}{2}$$
 (b)  $\frac{1}{5}$   
(c)  $\frac{27}{5}$  (d)  $\frac{1}{10}$ 

30.	Given $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ , find	the value of 'v' when
	f = 20 and $u = 30$ .	
	(a) –20	(b) –60
	(c) 60	(d) -30

- 31. The sum of three consecutive integers is 75. Which is the largest among them?
  (a) 26
  (b) 25
  (c) 24
  (d) 23
- **32.** The lengths of the sides of a triangle are (2a+1) cm, (3a+2) cm and (4a-1) cm. For what value of 'a' is the perimeter of the triangle 92 cm?

(a) 5	(b) 9
(c) 8	(d) 10

- **33.** A father is 26 years older than his son. In 3 years' time, the son's age will be one-third his father's age. What is the present age of the son?
  (a) 10 years
  (b) 13 years
  - (c) 39 years (d) 29 years
- 34. Pankaj has 96 marbles and Arun has 63 marbles. How many marbles should run give Pankaj so that Pankaj will have twice as many marbles as Arun?

(a) 9	(b) 12
(c) 7	(d) 10

35.	If $\frac{3p+2}{5} - \frac{4p-3}{7} + \frac{p-1}{35} = 4$ , find the value of		
	p.		
	(a) 65	(b) 63	
	(c) 36	(d) 56	
36.	The sum of five times a number and 13 is 48		
	What is the number?		
	(a) 3	(b) 5	
	(c) 7	(d) 9	
37.	Guru is 20 years older than his son. If the sum o		
	their ages is 50 years how old is his son?		
	(a) $5 \text{ years}$ (b) $10 \text{ years}$		
	(c) 15 years	(d) 20 years	
38.	If one-fourth of a number decreased by 12 is 30, what is the number?		
	(a) 168	(b) 186	
	(c) 148	(d) 184	
39.	If $C = \frac{5}{9}(F - 32)$ , what is the value F?		
	(a) $\frac{5C}{9} - 32$	(b) $\frac{9C}{5} - 32$	
	(c) $\frac{9C}{5} + 32$	(d) $\frac{5C}{9} + 32$	

**40.** The scale shown is balanced. Each cube on the left side weighs the same amount. How much does one of the cubes weigh?



**41.** The figure shows the selling price of pens in a shop. Vimal paid Rs. 50 for the purchase of a few pens and received *Rs*. 0.50 in change.



How many pens did Vimal buy?

- (a) 26 (b) 22
- (c) 19 (d) 16
- **42.** The sum of two-thirds of a number and one-fifth of the same number is 13. Find the number.

(a) 15	(b) 3
(c) 13	(d) 5

**43.** Evaluate 
$$\frac{x-4}{3} - \frac{2x+1}{6} = \frac{5x+1}{2}$$
  
(a)  $\frac{3}{5}$  (b)  $\frac{4}{5}$   
(c)  $\frac{5}{6}$  (d)  $\frac{-4}{5}$ 

44. The denominator of a fraction is 3 more than its numerator. If 2 is added to both the numerator and the denominator, the new fraction is equivalent to  $\frac{2}{3}$  What is the original fraction?

(c) 
$$\frac{2}{3}$$
 (d)  $\frac{3}{5}$ 

**45.** 144 beads were shared equally among some children. If there were 3 children fewer, each child would have 16 beads each. How many children were there?

(a) 8	(b) 9
(c) 12	(d) 11

### **Solution**

- 1. (C)  $\frac{3x-1}{5} \frac{1+x}{2} + \frac{x-1}{2} = 3$   $\Rightarrow 6x = 42 \Rightarrow x = 7$ 2. (B) 0.2(2x-1) - 0.5(3x-1) = 0.4 $\Rightarrow x = \frac{-1}{11}$
- **3.** (C) Transposing 3 to the R.H.S. gives the value of m.
- **4.** (A) Not available
- 5. (B) Not available
- **6.** (A) Not available
- 7. (B) Not available
- **8.** (C) Let the number be x.

$$\Rightarrow \frac{5x}{2} - 7 = 23 \Rightarrow \frac{5x}{2} = 23 + 7$$
$$\Rightarrow x = 30 \times \frac{2}{5} = 12$$

**9.** (A) The average yield par tree per year

$$=\frac{(x+2)\times 60 + x\times 120 + (x-2)\times 180}{(x+2+x+x-2)}$$
$$\Rightarrow 60x = 240 \Rightarrow x = 4$$

10. (A) Let the number be x. Then according to the problem,

$$\frac{(x+4) \times 5 - 20}{8} = 10$$

 $\Rightarrow x = 16$ 

**11.** (C) Not available

**12.** (B) Not available

**13.** (A) Let the present ages of A and B be 2x years and x years.

After 30 years, their ages will be

$$A = (2x + 30)$$
 years

B = (x + 30) years

So, 
$$2x + 30 = 1\frac{1}{2}(x + 30)$$

 $\Rightarrow x = 30$ 

 $\therefore$  Present age of B = 30 years

 $\Rightarrow$  Present age of  $A = 2 \times 30 = 60$  years

**14.** (B) Let the total distance be x km.

$$\therefore \quad x - \left(\frac{5x}{8} + \frac{x}{4}\right) = 15 \text{ (Given)}$$

 $\Rightarrow x = Rs. 1200$ 

$$\therefore$$
 Second prize =  $Rs.\frac{3}{4}x$ 

Third prize =  $Rs.\frac{1}{2} \times \frac{3x}{4} = Rs.\frac{3x}{8}$ 

$$\therefore Rs.\left(x + \frac{3x}{4} + \frac{3x}{8}\right) = Rs.2550$$

 $\Rightarrow x = Rs.1200$ 

- **16.** (A) Not available
- **17.** (B) Not available
- **18.** (C) Not available
- **19.** (A) Not available
- **20.** (A) Not available
- **21.** (C) Not available

- 22. (A) A linear equation has only one variable of degree 1. So it has only one solution.
- **23.** (D) Let the marks of Sonu be x. Then Ramesh's marks x = 5. Total marks = 15

 $\Rightarrow 2x+5=15 \Rightarrow x=5$ 

 $\therefore$  Marks got by Ramesh = x + 5 = 10

24. (B) Let the number of runs scored by Sehwag be 'r'.

According to the problem, the number of runs scored by Sachin = 2r

Also  $r + 2r = (2 \times 100 - 2)$ 

- $\Rightarrow$  r = 66
- $\Rightarrow$  Sachin's score
- **25.** (C) Not available
- **26.** (A) Not available
- **27.** (A) Not available
- **28.** (C) Not available
- **29.** (D) A = P(1 + rt)
  - $\Rightarrow$  27 = 18(1 + 5r)

$$\Rightarrow r = \frac{27 - 18}{18} \times \frac{1}{5} = \frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$$

**30.** (C)  $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$   $\Rightarrow \frac{1}{v} = \frac{1}{20} - \frac{1}{30} = \frac{3-2}{60} = \frac{1}{60}$   $\Rightarrow v = 60$ **31.** (A) Let the smallest integer be x - 1.

Then the three consecutive integers are x-1, x and x+1. Their sum = 75  $\Rightarrow (x-1)+x+(x+1) = 75$   $\Rightarrow x = 25$   $\therefore \text{ The largest of the numbers}$  x+1 = 26(D) Perimeter = (2a+1)+(3a+2)+(4a-1) = 92

$$\Rightarrow a = \frac{92-2}{9} = \frac{90}{9} = 10$$

32.

**33.** (A) Let the son's present age be x years. Then the father's age is (26 + x) years. In 3 years' time, son's age = (x + 3)years and father's age = (26 + x + 3) years = (x + 29) years.

$$\Rightarrow x+3 = \frac{1}{3}(x+29)$$

 $\Rightarrow x = 10$ 

 $\therefore$  The present age of the son is 10 years.

**34.** (D) Let the number of marbles that Arun should give Pankaj be 'x' Then according to the problem, (96 + x) = 2(63 - x) $\Rightarrow 3x = 30 \Rightarrow x = 10$ 

**35.** (D) Given 
$$\frac{3p+2}{5} - \frac{4p-3}{7} + \frac{p-1}{35} = 4$$

$$\Rightarrow 2p + 28 = 140 \Rightarrow p = 56$$

**36.** (C) Let the number be 'x'

Given  $5x + 13 = 48 \Longrightarrow x = 7$ 

**37.** (C) Let the age of the son be 'x' years.

So the age of Guru is x + 20 years.

Given sum of the ages of Guru and his son = 50

years

 $\Rightarrow x + x + 20 = 50$ 

$$\Rightarrow \qquad 2x = 50 - 20 \Rightarrow x = 15$$

- **38.** (A) Not available
- **39.** (C) Not available
- **40.** (C) Let x g be the weight of each cube.

Then  $4xg = 20g \Longrightarrow x = 5$  grams

**41.** (B) Given that the cost of 5 pens is Rs.11.25,

the number of pens purchased by

Vimal = 
$$\frac{Rs.(50 - 0.50)}{Rs.11.25} \times 5$$

$$=\frac{Rs.49.50}{Rs.11.25} \times 5 = 22$$

**42.** (A) Let the number be 'n'.

Then 
$$\frac{2n}{3} + \frac{n}{5} = 13$$
  
 $\Rightarrow n = \frac{13 \times 15}{13} = 15$ 

**43.** (D) 
$$\frac{x-4}{3} - \frac{2x+1}{6} = \frac{5x+1}{2}$$

$$\Rightarrow x = \frac{-24}{30} = \frac{-4}{5}$$

**44.** (B) Let the numerator of the original fraction be

x.

Then its denominator is x + 3.

$$\Rightarrow \text{ Original fraction} = \frac{x}{x+3}$$
$$\Rightarrow \frac{x+2}{x+5} = \frac{2}{3} \text{ (Given)} \Rightarrow x = 4$$

$$\therefore$$
 Original fraction  $=\frac{4}{7}$ 

**45.** (C) Let the number of children be x.

Then (x-3)16 = 144

$$\Rightarrow x = \frac{144}{16} + 3 = 9 + 3 = 12$$