MATHS

BOOKS - ICSE

SIMPLE LINEAR EQUATIONS

Example

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1. Solve : $3x + 5 = 14$

A. 2

B. 4

C. 3

D. 5

Answer: C

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2. Solve : $\dfrac{3}{5}x + 2 = \dfrac{12}{5}$

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3. Solve : $2y + \dfrac{5}{2} = \dfrac{37}{2}$

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4. Solve : $5x - 7 = 2x + 8$

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5. Solve : $3x + 2(x + 2) = 20 - (2x - 5)$

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6. Solve the equations and check your answer in the case:

$$x - \left(2x - \frac{3x - 4}{7}\right) = \frac{4x - 27}{3} - 3$$

7. Solve: $0.4x + 2.7 = 2.9x - 3.55$

8. One number is 6 times the other. The difference of the two numbers is 75. Find the

two numbers.

9. The sum of the digits of a two digit number is 7. If the digits are reversed, the new number decreased by 2, equals twice the original number. Find the number.

A. 25

B. 28

C. 43

D. 32

Answer: A

10. Raju's father's age is 5 years more than three times Raju's age. Find Raju's age.if his father is 44 years old.

A. Raju is 15 years old

B. Raju is 14 years old

C. Raju is 13 years old

D. Raju is 16 years old

Answer: C

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11. The sum of three consecutive multiples of 3 is 54. Find them

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12. The length of a rectangle exceeds its breadth by 4 m. Find the dimensions of the rectangle if its perimeter is 84 m.

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13. Two complementary angles differ by $12°$ Find them .

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14. The solution of an equation is x = 8

a. Form one or more linear equations in terms of x.

b.Write one or more real - life situations , which can be written as linear equations , each of which has the given solution.

15. The weight of grain in one store is twice that in the other. If 750 tonnes of grain from

the first store and 350 tonnes of grain from the second store are taken out , the weight of grain in both the stores will be the same. Find the weight of grain in each store.

16. One - fourth of a herd of deer have gone to the forest. One - third of the total number of deer are grazing in a field and the remaining 15 are drinking water on the bank of a river . Find the total number of deer in the herd.

17. There are 90 multiple-choice questions in a test. Every correct answer is awarded 2 marks each and 1 mark is deducted for every incorrect answer from the total score. If a student scored 60 marks in the test, find how many questions were answered correctly by him.

18. In a certain party, there is a bowl of soup for every two guests, a bowl of rice for every three guests, and a bowl of dessert for every four guests. If in all there were 65 bowls of food, how many guests were there in the party?

A. 60 guests

B. 50 guests

C. 40 guests

D. 30 guests

Answer: A

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19. A car is driven at an average speed of 30 km/hr for 15 minutes. At what speed should the car be driven, if the same distance is to be covered in 18 minutes?

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Warm Up Exercise

1. Write the following statements in the form of equations.

The sum of five times a number and 3 is 38.

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2. Write the following statements in the form of equations.

A number reduced by 4 is 14.

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3. Write the following statements in the form of equations.

3 less than 5 times a number y is equal to the sum of 8 and 3 times the number y.

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4. Solve the following equations by trial - and - error method .

7 - 3a = 1

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5. Solve the following equations by trial - and - error method .

6p - 2 = 3p + 13

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1. Solve : $5x - 6 = 9$

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2. Solve : $\dfrac{3m}{10} - 2 = 4$

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3. Solve : $\dfrac{2}{5}p + 3 = \dfrac{18}{5}$

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4. Solve : $7 - 5x = 5 - 7x$

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5. Solve : $5(2x - 3) - 3(3x - 7) = 5$

6. Solve : $\dfrac{x - 2}{4} + \dfrac{1}{3} = x - \dfrac{2x - 1}{3}$

7. Solve : $3.7x + 5.2 = 0.3x + 13.7$

8. One-fourth of a number exceeds one-fifth of the number by 4. Find the number.

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9. Find three consecutive even numbers whose sum is 66.

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10. Reema's age is 6 years less than twice of Deepti's age.If Reema is 42 years old, find Deepti's age.

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11. The sum of two digits of a two-digit number is 11. If 45 is added to this number, the digits get reversed. Find the number.

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12. One supplementary angle is $20°$ more than the other. Find the two angles.

13. Two equal sides of an isosceles triangle are 4 m less than 3 times the third side. Find the dimensions of the triangle, if the perimeter is 55 m.

14. Form a linear equation and a word problem with solution 12.

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15. In a group of children, one-fifth play football, one-fourth play basketball, two-fifths play cricket, and the remaining 30 play other games. Find the total number of children in the group.

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16. Neha wants Swati to deliver a box containing 50 glasses to her friend's house. Neha promises to pay Swati Rs3 for every glass she delivers and fine her Rs2 for every glass she breaks. If Swati receives Rs90 from Neha, find the number of glasses that were broken on the way.

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17. A cyclist is moving at a speed of 20 km/h for 20 minutes. By how much should he increase

his speed if he needs to cover the same distance in 15 minutes?

Exercise 7 1

1. Solve: $8x - 5 = 3x + 55$

2. Solve: $\dfrac{x}{3} - 2 = \dfrac{x}{4} + 5$

3. Solve: $\dfrac{x}{5} + 3 = \dfrac{x}{6} + 12$

4. Solve: $\dfrac{3}{8}(x - 5) = 9 - 2x$

5. Solve:

$$2(3x - 2) - 3(4 - 5x) = 7(1 - 2x) + 12$$

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6. Solve: $0.4(a + 1.4) = 0.72$

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7. Solve: $1.3y - 1.6 = 5.75 - 0.8y$

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8. Solve: $2.3x - 0.4 = 2.8 + 0.7x$

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9. Solve: $4.9x + 2.6 = 5.8 - 1.5x$

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10. Solve : $\dfrac{x}{2} + \dfrac{x}{4} = \dfrac{x}{6} + \dfrac{7}{6}$

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11. Solve : $\dfrac{x}{3} - \dfrac{x}{5} = \dfrac{x}{2} - 22$

12. Solve : $\dfrac{2y}{3} - \dfrac{5}{8} = \dfrac{3}{4} - \dfrac{y}{2}$

13. Solve: $\dfrac{2}{3}x - \dfrac{3}{4}x + \dfrac{4}{5}x = \dfrac{2}{15}$

14. Solve: $\dfrac{(t-7)}{5} = \dfrac{(8-5t)}{9}$

15. Solve: $\dfrac{(3y-4)}{2} = \dfrac{(5-2y)}{4}$

16. Solve: $\dfrac{3}{2}(2-4x) - \dfrac{4}{5}(3-2x) + \dfrac{63}{5} = 0$

17. Solve: $\dfrac{3y}{4} - \dfrac{2}{7} = \dfrac{3}{2} + \dfrac{y}{3}$

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18. Solve: $\dfrac{2}{3}x + \dfrac{3}{2}x - \dfrac{3}{4}x = \dfrac{17}{4}$

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19. Solve: $\dfrac{(5x - 3)}{6} - \dfrac{(2x - 1)}{3} = \dfrac{(4 - 3x)}{2}$

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20. Solve: $2x - \left[3x - \dfrac{(2x - 5)}{8}\right] = 2x - \dfrac{9}{4}$

1. $\dfrac{5}{2}$ less than one-third of a number is 6. Find the number.

2. Three-sevenths of a number is greater than two-fifths of the number by 4. Find the number.

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3. One number is 4 times the other and the difference between the two numbers is 21. Find the two numbers.

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4. Six more than seven times a number is 34. Find the number.

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5. The sum of three consecutive multiples of 3 is 72. Find the three numbers.

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6. The sum of two digits of a two-digit number is 11. If 63 is added to the number, the digits get reversed. Find the number.

7. A given number is trebled to get a second number. This number is also trebled to get a third number. The sum of these three numbers is 12 more than 12 times the original number. Find the original number. 8.

8. Ratan is four times as old as Mita. If the sum of their ages is 20 years, find their ages.

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9. Kiran is five times as old as her niece Poonam. After five years, Kiran will be thrice as old as Poonam. Find their present ages

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10. Kiran is 15 years older than Rajat. After six years, their ages will be in the ratio 3:2, find their ages.

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11. The length of a rectangular room is twice its breadth. If the perimeter of the room is 180cm, find the sides of the room.

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12. A rectangular field is such that its length is one and a half times its breadth. A thick white line is drawn all along the edges of the field. If the total length of the white line is 200 m, find the length of the sides of the field.

13. If two complementary angles differ by $14°$, find the angles.

14. If two supplementary angles differ by $36°$, find the angles.

15. In an isosceles triangle, each of the two equal sides is 10cm less than three times the base. If the perimeter of the triangle is 330cm, find the lengths of the sides of the triangle.

16. A parallelogram is such that its length is 5 cm less than twice its breadth. If the perimeter of the parallelogram is 44 cm, find the length of its sides.

17. Formulate a linear equation and a word problem, each with solution 18.

1. A full-sleeve shirt costs Rs 75 more than a half-sleeve shirt. If the cost of 4 full-sleeve shirts and 5 halfsleeve shirts cost Rs2325, find the cost of each.

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2. A man covers one-fifth of his journey on foot, two-thirds by car, and the remaining 4 km

by taxi. Find the total distance covered by the man.

A. 24 km

B. 50 km

C. 10 km

D. 30 km

Answer: D

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3. Pranav had a basket of fruits. He gave one-fourth of the fruits to a friend, three-fifths to his cousin, and ate the remaining 6 fruits himself. Find the total number of fruits in the basket.

A. 8

B. 40

C. 6

D. 48

Answer: B

4. A host has arranged 2 bowls of soup for every three guests, one bowl of main dish for every four guests, and a bowl of dessert for every five guests. There are 134 bowls of food at the party. Find the number of guests at the party.

5. A question paper has 20 questions, the answer to each of which is either true or false. A student scores 3 marks for every correct answer and loses 2 marks for every incorrect answer. If a student scores 25 marks, find the number of questions he answered correctly and the questions he answered incorrectly.

6. A daily wage worker works for 23 days in a month. He gets Rs 400 per working day. However, his supervisor is very strict and fines him Rs 100 for each day he arrives late to work. If at the end of the 23 days, the worker has earned Rs 8000, find out the number of days he reached for work on time and the number of days he was late.

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7. The capacity of a water tank is three times the capacity of another water tank. If 450 L of water is taken out from the first tank and 50 L from the second tank, then the remaining water in the two tanks is equal. Find the capacity of both the tanks.

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8. There are two confectioneries in a locality. The number of chocolate boxes in the first

shop is 250 less than twice the number of chocolate boxes available in the second shop. By the end of the day, the first shop has sold 350 boxes and the second shop has sold 200 boxes. The number of boxes left unsold in both the shops is equal. Find the number of chocolates in both the shops at the beginning of the day.

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9. Ajay starts from his house to his office by his car which is 15 km away at an average speed of 45 km per hour. On the way back, he takes a route longer by 5 km since there is heavy traffic on the regular route. If he reaches home in the same time as the time he took to reach office in the morning, find his speed on the return journey.

10. Mohan drives to a marketplace which is 30 km away from his home at an average speed of 75 km per hour. After he completes his shopping, he decides to visit his friend. If he drives at the same speed as on his way to the market and it takes him 30 minutes to reach his friend's house, find the distance between the market and the friend's house.

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Revision Exercise

1. Solve the following equations and verify the results.

$$5x - 2 = 3x - 4$$

    A. x = - 2

    B. x = - 3

    C. x = - 1

    D. x = - 4

Answer: C

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2. Solve the following equations and verify the results.

$$\frac{m}{5} + \frac{m}{2} - 4 = \frac{m}{3} + 7$$

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3. Solve the following equations and verify the results.

$$\frac{a}{7} + 8 = a + 6$$

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4. Solve the following equations and verify the results.

$$5(2p + 3) - 3(2p - 3) = 4$$

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5. Solve the following equations and verify the results.

$$2(y - 2) + 3(4y - 1) = 0$$

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6. Solve the following equations and verify the results.

$$\frac{2}{3}(t - 5) - \frac{1}{4}(t - 2) = 1$$

7. Solve the following equations and verify the results.

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

8. Solve the following equations and verify the results.

$$\frac{x-6}{4} - \frac{x-4}{6} = 1 - \frac{x}{10}$$

9. Solve the following equations and verify the results.

$$5 - 2\left(\frac{x}{3} + 1\right) = \frac{2}{3}x + 3 - 11x$$

10. Solve the following equations and verify the results.

$$0.6x + \frac{2x}{3} = 12x + 1.5$$

A. $x = \dfrac{49}{312}$

B. $x = \dfrac{37}{312}$

C. $x = \dfrac{45}{322}$

D. $x = \dfrac{-45}{322}$

Answer: D

11. Solve the following equations and verify the results.

$$1.4x + 3.1x = 2.3x + 1.1$$

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12. Solve the following equations and verify the results.

$$4x - \left[2x - \frac{(3x - 7)}{5}\right] = 2x + 1$$

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13. Solve the following equation and verify the results.

$$\frac{(3x + 4)}{8} - \frac{(2x + 5)}{5} = \frac{(3 - 4x)}{10}$$

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14. Solve the following equations and verify the results.

$$6x + 9 = 3x + 57$$

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15. Solve the following equations and verify the results.

$$\frac{2}{9}(x + 3) = 4x - 7$$

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16. Solve the following equations and verify the results.

$$4(3x + 5) - 6(2 - x) = 8(7 + x) + 22$$

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17. Solve the following equations and verify the results.

$$\frac{2}{5}(4 - 2x) - \frac{3}{4}(2 - 5x) = \frac{7}{5}$$

18. In a class, the number of boys is $\frac{3}{2}$ times the number of girls. If there are 55 students in the class, find the number of boys and girls in the class.

19. Find four consecutive odd numbers whose sum is 136.

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20. A number is such that it is as much greater than 84 as it is less than 108. Find the number.

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21. Eight more than 5 times a number is 78. Find the number.

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22. Seven eighths of a number is greater than half the number by 9. Find the number.

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23. A number consists of two digits that add up to 7. If 27 is added to this number, the digit get reversed. Find the number.

A. 24

B. 25

C. 30

D. 29

Answer: B

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24. A number is doubled to get a second number which is further doubled to get a third number. When these three numbers are added, it is found that the sum is 8 less than 8 times the original number. Find the original number .

25. A two-digit number is such that the sum of its two digits is 11. If 27 is subtracted from this

number, the new number is such that the digits of the original number are reversed. Find the original number.

26. Suresh has three boxes of different fruits. Box 1 weighs $2\dfrac{1}{2}$ -kg more than Box 2 and Box 3 weighs $10\dfrac{1}{4}$ kg more than Box 2. If the total weight of the three boxes is $48\dfrac{3}{4}$ kg, find the weight of each box.

27. Rahul's age is one-fourth of Seema's age. If the difference between their ages is 12 then find their ages .

28. Sudha is four times as old as Rita. After 12 years, Sudha will be twice as old as Rita. Find their present ages.

29. Alka's age is 5 years more than 4 times the age of Suman. If Alka's age is 45 years, find Suman's age.

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30. The length of a rectangular field is twice its breadth. If the perimeter of the field is 150 m, find the dimensions of its sides.

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31. A silk scarf is in the shape of an isosceles triangle. The two equal sides of the scarf are 8 cm more than twice the third side. If the perimeter of the scarf is 71 cm, find the lengths of the sides of the scarf.

32. Two complimentary angles differ by $44°$

Find the two angles

33. The difference between two supplementary angles is $72°$ Find the angles.

34. A man spends one-third of his monthly income on food, one-fourth on children's education, and one-sixth on clothing. He keeps the remaining $Rs 7,000$ for miscellaneous expenses of the month. Find his monthly income.

A. Rs 35, 000

B. Rs 7, 000

C. Rs 28, 000

D. Rs 21, 000

Answer: C

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35. In an examination, a student requires 40% of the total marks to pass. If the student

secures 185 marks and fails by 15 marks, find the total marks.

36. A confectionery sells two types of chocolate boxes, medium and small. The medium box costs Rs 50 more than the small box. The cost of three medium boxes and four small boxes is Rs 1550. Find the cost of each.

37. Milan has planned a treat for her friends. She has sandwiches, pastries, and noodles on the menu. The sandwiches are packed in boxes such that each box has four sandwiches, pastries are packed two each in a box, and the box of noodles serves three persons. If there are a total of 52 boxes, and each friend receives all the three items, find how many friends Milan treated.

38. Priya is driving at an average speed of 60 km/hr. She reaches her friend's house in 20 minutes. On her way back, she takes 30 minutes to reach home. Find her average speed on her return journey.

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39. There are 30 objective-type questions in an examination. For every correct answer, a student scores 5 marks and for very incorrect

answer, 3 marks are deducted. If a student attempts all the questions and scores 94 marks, find how many questions he answered correctly.

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40. Find three consecutive multiples of 4 that add upto 84.

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41. Amit is 21 years younger than Surbhi. After nine years,their ages will be in the ratio 4:3, find their ages.

42. Form a linear equation and a real-life situation, which can be written as a linear equation, with each equation having solution 15.

1. Three times the difference of one - third of a number and one - fifth of a number. When added to the sum of one - third of the number and one - fifth of the number is one less than the number . Find the number.

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1. Solve and verify the solution obtained in each of the following equations.

$3p - 7 = 20$

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2. Solve and verify the solution obtained in each of the following equations.

$5x + 7 = 32$

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3. Solve and verify the solution obtained in each of the following equations.

$$2p - 3 = 23$$

4. Solve and verify the solution obtained in each of the following equations.

$$3x - 5 = 28$$

5. Solve and verify the solution obtained in each of the following equations.

$$4(m + 3) = 20$$

6. A bookshop sells books in two types of packing, one small and one large. A large pack contains as many as 10 small packs plus 5 loose books. Set up an equation which gives the number of books in each small pack. The number of books in a large pack is 115.

A. $10x + 15 = 105$

B. $10x + 5 = 115$

C. $9x + 5 = 115$

D. $10x + 5 = 155$

Answer: B

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7. Sachin's father's age is 3 years more than

three times Sachin's age. Sachin's father is 51

years old. Set up an equation to find Sachin's age.

8. Ramesh says that he has 8 notebooks more than four times the number of notebooks Anuj has. Ramesh has 48 notebooks. How many notebooks does Anuj have?

A. 10

B. 20

C. 40

D. 48

Answer: A

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