Finding the Unknown

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The solution of 7x + 17 = 38 is:
(a) x = 21 **(b)** x = 4 **(c)** x = 7 6/7 **(d)** x = 3

2. "9 more than a number y is 20" as an equation is:
(a) y + 9 = 20 **(b)** 9y = 20 **(c)** y − 9 = 20 **(d)** y = 20 + 9

3. Which value of x satisfies 3x − 2 = 13?
(a) 4 **(b)** 15 **(c)** 6 **(d)** 5

4. If x/16 = 0, then x = ?
(a) 1/16 **(b)** 16 **(c)** 1 **(d)** 0

5. Transposing +7 from the LHS to the RHS of an equation makes it:
(a) −7 on the RHS **(b)** × 7 on the RHS **(c)** ÷ 7 on the RHS **(d)** +7 on the RHS

6. If 2x = 57 − 7, then x = ?
(a) 32 **(b)** 25 **(c)** 50 **(d)** 24

7. If 8(x − 1) = 48, then x = ?
(a) 56 **(b)** 6 **(c)** 8 **(d)** 7

8. Which of these is an equation?
(a) 6x **(b)** 6x + 8 **(c)** 6x + 8 = 20 **(d)** 6x + 8 > 20

Section B — Short answer — 8 × 2 = 16 marks

9. Solve: 9x − 14 = 31

10. Solve: 8x − 19 = −51

11. Solve: 5(x + 2) = 60

12. Solve: $x/5 + 7 = 16$

13. Solve: $38 - 5y = 8$

14. Write an equation and solve: "Seven times a number decreased by 1 is 83."

15. Check whether $x = 4$ is a solution of $3x + 1 = 16$. Show your working.

16. Solve: $2p + 24 = 46$

Section C — Word problems — 4 × 4 = 16 marks

17. The length of a rectangle is 5 cm more than its breadth. Its perimeter is 66 cm. Find the length and breadth.

18. A father is 3 times as old as his son. The sum of their ages is 48 years. How old is the son?

19. The sum of three consecutive whole numbers is 78. Find the numbers.

20. Meera has Rs 27. Her mother gives her money to buy 8 notebooks, all at the same price. Now Meera has Rs 179. What is the price of one notebook?

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Answer key

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Q	Answer	Working
1	**(d) x = 3**	7x = 38 − 17 = 21, x = 3
2	**(a) y + 9 = 20**	—
3	**(d) 5**	3 × 5 − 2 = 13
4	**(d) 0**	0 × 16 = 0
5	**(a) −7 on the RHS**	a term changes sign when transposed
6	**(b) 25**	2x = 50, x = 25
7	**(d) 7**	x − 1 = 6, x = 7
8	**(c) 6x + 8 = 20**	an equation has an equals sign with expressions on both sides
9	**x = 5**	9x = 31 + 14 = 45; x = 45 ÷ 9 = 5
10	**x = −4**	8x = −51 + 19 = −32; x = −32 ÷ 8 = −4
11	**x = 10**	x + 2 = 60 ÷ 5 = 12; x = 10
12	**x = 45**	x/5 = 9; x = 45
13	**y = 6**	5y = 38 − 8 = 30; y = 6
14	**7n − 1 = 83; n = 12**	7n = 83 + 1 = 84; n = 12
15	**No**	3 × 4 + 1 = 13 ≠ 16 (the solution is x = 5)
16	**p = 11**	2p = 22; p = 11
17	**breadth = 14 cm, length = 19 cm**	2(b + 5 + b) = 66 → 4b + 10 = 66 → 4b = 56 → b = 14
18	**12 years (father 36 years)**	x + 3x = 48 → 4x = 48 → x = 12
19	**25, 26, 27**	n + (n + 1) + (n + 2) = 78 → 3n + 3 = 78 → n = 25
20	**Rs 19**	27 + 8x = 179 → 8x = 152 → x = 19