

## Ch. 4 Linear Equations in One Unknown

### Conventional Questions

1. [16-17 Mid-year Exam Q6]

Solve the following equations.

(a)  $0.3x + 5 = x - 0.2x + 1$ . (2 marks)

(b)  $-5 + \frac{5}{6}w = -w$ . (3 marks)

2. [16-17 Mid-year Exam Q10]

If the sum of three consecutive odd numbers is 279, find the smallest number. (3 marks)

3. [16-17 Final Exam Q3]

(a) The difference of two numbers is 5 and their sum is 39. Find the smaller number. (2 marks)

(b) Solve  $\frac{2y-1}{7} = 3$ . (2 marks)

4. [17-18 Standardized Test #3]

(a) Solve  $-5(x-6) = 30$ . (2 marks)

(b) Solve  $2 - \frac{x}{3} = \frac{3x}{7}$ . (3 marks)

5. [17-18 Standardized Test #7]

Anna, Betty and Chloe have 100 stickers in total. The number of stickers Anna has is three times of the number Betty has. The number of stickers Chloe has is 30 more than the number Betty has. Anna claims that she has the greatest number of stickers among three of them. Do you agree? Set up an equation and solve it to support your answer. (3 marks)

6. [17-18 Mid-year #2]

Solve the following equations.

(a)  $3(a-7) = -27$  (2 marks)

(b)  $\frac{b}{3} + \frac{2b}{15} = 14$  (2 marks)

(c)  $2(30-c) - 5(c-7) = -24$  (3 marks)

7. [17-18 Mid-year #6]

There were  $n$  eggs in a refrigerator. After using 14 eggs to make a cake, Alice bought  $2n$  more eggs. If there are 34 eggs now, find the value of  $n$  by setting up an equation. (2 marks)

8. [17-18 Final #3]

Ann's age is 3 times her brother's age. If the difference of their ages is 4, find their ages.

(3 marks)

9. [18-19 Standardized Test #3]

Solve the equation  $\frac{y+2}{5} = \frac{1}{4} + \frac{3(y-3)}{10}$ . (3 marks)

10. [18-19 Standardized Test #5]

A pen cost \$  $x$ . A rubber is \$3 cheaper than the pen.

(a) Express the total cost of a dozen of rubbers in terms of  $x$ . (1 mark)

(b) It is known that  $x$  is a positive integer. Is it possible that the cost of a dozen of rubbers is \$54? (2 marks)

11. [18-19 Standardized Test #6]

Alice poured some water at  $25^{\circ}\text{C}$  into a container. She then put the container into a refrigerator to make ice. The temperature change of water is  $-3^{\circ}\text{C}$  in the first hour and  $-5^{\circ}\text{C}$  every hour afterwards in the refrigerator.

(a) What is the temperature of the water 4 hours later? (1 mark)

(b) The temperature of ice will reach  $-13^{\circ}\text{C}$   $x$  hours later. Find the value of  $x$ . (2 marks)

12. [18-19 Standardized Test #7]

Alan, Ben and Calvin share 60 sweets among them. The number of sweets Alan gets is 5 more than the number of sweets Ben gets. The number of sweets Ben gets is 10 less than twice the number of sweets Calvin gets. Calvin claims that he gets more sweets than Alan. Do you agree? Explain your answer. (3 marks)

13. [18-19 Mid-year #5]

If the sum of two consecutive odd numbers is 188, find the smaller number. (2 marks)

14. [18-19 Mid-year #10]

Consider the arithmetic sequence 36,  $x$ , 12, 0, ...

(a) Write down the value of  $x$ . (1 mark)

(b) Write down the general term of the sequence. (1 mark)

15. [18-19 Mid-year #11]

Lily has a total of 40 coins. 7 of them are \$1 coins and the rest are \$2 and \$5 coins. If the total value of the coins is \$106, find the number of \$2 coins Lily has. (3 marks)

16. [18-19 Mid-year #14]

(a) Solve  $8 - 2k = 5(k - 3) + 2$ . (2 marks)

(b) Hence, or otherwise, solve  $8 - 2\left(\frac{n+1}{3}\right) = 5\left(\frac{n+1}{3} - 3\right) + 2$ . (Level 3) (3 marks)

17. [18-19 Final #2]

Solve  $\frac{m}{6} + \frac{5-m}{4} = 2$ . (3 marks)

18. [19-20 Standardized Test 1, #3]

Solve  $2(b - 4) = 34$ . (3 marks)

19. [19-20 Standardized Test 1, #5]

Suppose there are 1 000 birds living in the New Territories in winter, and  $2x^2$  of them carry bird flu.

(a) Express the number of birds that do not carry bird flu in terms of  $x$ . (1 mark)

(b) Hence, or otherwise, find the number of birds that do not carry bird flu if  $x = 10$ .

(2 marks)

20. [19-20 Standardized Test 1, #7]

Solve  $2 + \frac{2-x}{5} = 8$ .

(3 marks)

21. [19-20 Mid-year, #6]

Solve the following equations:

(a)  $2.2x - 1 = 0.2x + 1$

(2 marks)

(b)  $\frac{3-5x}{-2} = 10$

(2 marks)

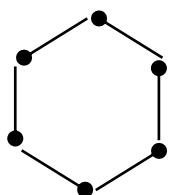
22. [19-20 Mid-year, #13]

Wesley has some \$5-coins and \$10-coins. The number of \$10-coins is 5 less than twice of \$5-coins. The total value of the coins is \$200. Find the number of \$5-coins that Wesley has.

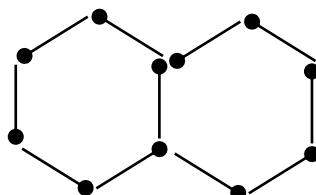
(3 marks)

23. [19-20 Mid-year, #14]

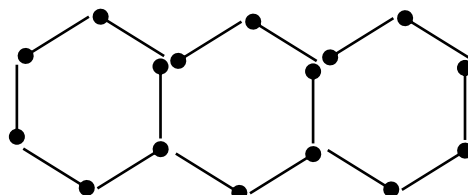
Matches are used to form regular hexagonal patterns with  $n$  hexagons as shown below, for  $n = 1, 2, 3, \dots$



$n = 1$



$n = 2$



$n = 3$

(a) Write down the number of matches used when  $n = 4$ .

(1 mark)

24. [19-20 Mid-year, #16]

Solve  $\frac{x+2}{\frac{2x-1}{6}+3} = \frac{5}{4}$ .

(3 marks)

25. [20-21 Mid-year, #4]

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

(2 marks)

26. [20-21 Mid-year, #5]

Solve  $3 - \frac{2x}{7} = 9$ .

(2 marks)

27. [20-21 Mid-year, #6]

Mary and Cathy share 103 candies. If Cathy gets 13 more candies than Mary.  
Find the number of candies that Cathy gets.

(3 marks)

28. [20-21 Mid-year, #10]

Solve  $\frac{4}{3} \left( \frac{x+1}{3} - \frac{1-x}{2} \right) = \frac{1}{3}$ .

(3 marks)

29. [20-21 Final Exam, #6]

Solve  $\frac{3-x}{6} = \frac{2}{3}$ .

(2 marks)

30. [20-21 Final Exam, #14]

Janice and Karen shared some books. Originally, Karen has 20 books less than Janice. After Janice buying 30 extra books for herself, the number of books that Janice has now became twice that of Karen. Find the number of books owned by Janice originally.

(3 marks)

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