

Solutions to Word Problems
Nanyang Paper 2
P6 Mathematics CA1 2018

Show your working clearly in the space provided for each question and write your answers in the spaces provided.

6. Height of 1 table = $\frac{21}{8} \div 3 = \frac{7}{8}$ m

Thickness of 1 dictionary = $\frac{1}{8} \times \frac{7}{8} = \frac{7}{64}$ m

Thickness of 2 dictionary = $2 \times \frac{7}{64} = \frac{7}{32}$ m

Ans: $\frac{7}{32}$ m

7. Percentage of animals that were hamsters = $100 - 25 - 45 - 18 = 12\%$

12% \rightarrow 24 hamsters

1% $\rightarrow 24 \div 12 = 2$

100% $\rightarrow 2 \times 100 = 200$

Total number of animals = 200

Ans: 200

8. Original production rate of machine = $120\,000 \div 6$
= 20 000 boxes of chocolate per hour
Additional production per hour = $9000 \div 2 = 4500$ boxes of chocolate per hour
Production of boxes of chocolates per hour = $20\,000 + 4500$
= 24 500 boxes of chocolate in one hour

Ans: 24 500 boxes

9. Original volume of water = $35 \times 25 \times 18 = 15\,750 \text{ cm}^3 = 15.75 \text{ l}$
Capacity of tank = $15.75 + 2.6 - 0.85 = 17.5 \text{ l} = 17\,500 \text{ cm}^3$

Ans: $17\,500 \text{ cm}^3$

10. a)

Average price of all items = \$78.60

Total number of items = 5

(as this is the only multiple that can result in total price whole number in dollars)

Total number of pairs of shoes = $5 - 3 = 2$

Total amount = $5 \times 78.60 = \$393$

Average price of a pair of shoes = $393 - 75 = \$318 \div 2 = \159

Ans: (a) 2
(b) \$159

11. Let number of marbles Wei Yan had originally = $56u$

(56 is multiple of 7,8)

Number of marbles given to friend = $\frac{3}{8} \times 56u = 21u$

Remaining marbles = $56u - 21u = 35u$

Number of marbles given to brother = $\frac{5}{7} \times 35u = 25u$

Remainder from original marbles before cousin's gift = $56u - 21u - 25u = 10u$

At the end,

$$10u + 408 = 2 \times 56u$$

$$112u - 10u = 408$$

$$102u = 408$$

$$u = 408 \div 102 = 4$$

Original number of marbles = $56u = 56 \times 4 = 224$

Ans: 224

12. Percentage of girls = $(100 - 45) \times \frac{1}{5} = 11\%$

Percentage of boys = $100 - 45 - 11 = 44\%$

Difference in percent between boys and girls = $44 - 11 = 33\%$

$33\% \rightarrow 660$

$1\% \rightarrow 660 \div 33 = 20$

$100\% = 20 \times 100 = 2000$

Ans: 2000

13. Number of lychee cookies = $0.4 \times 300 = 120$

At the end, percent of lychee cookies = 60%

$60\% \rightarrow 120$

$10\% \rightarrow 120 \div 6 = 20$

$100\% \rightarrow 20 \times 10 = 200$

Number of chocolate cookies sold = $300 - 200 = 100$

Ans: 100

14. a)

At first,

$$\text{Amount Cindy had} = 10y + 24$$

$$\text{Amount Linda had} = 10y \div 2 = 5y$$

$$\text{Total amount at first} = 10y + (10y + 24) + 5y = \$(25y + 24)$$

b)

$$\text{Amount after buying present} = 25y + 24 - (4y + 5) = 21y + 19$$

$$= 21 \times 7 + 19 = \$166$$

$$\text{Ans: (a) } \$(25y + 24)$$

$$(b) \$166$$

15. a)

$$\angle FBG = 27^\circ \quad (\text{as ABGF is rhombus})$$

$$\angle ABF = 27^\circ \quad (\text{as ABGF is rhombus})$$

$$\angle DBG = 180 - 25 - 27 - 27 = 101^\circ$$

b)

$$\angle FBD = 27 + 101 = 128^\circ$$

$$\angle BDG = 25^\circ \quad (\text{BCDG is parallelogram})$$

$$\angle BDE = 25 + 83 = 108^\circ$$

$$\angle DFE = 25^\circ \quad (\text{parallel lines})$$

$$\angle BFE = 25 + 27 = 52^\circ$$

$$\angle DEF = 360 - \angle FBD - \angle BDE - \angle BFE \quad (\text{total angles of trapezium BDEF})$$

$$= 360 - 128 - 108 - 52 = 72^\circ$$

$$\text{Ans: (a) } 101^\circ$$

$$(b) 72^\circ$$

16. a)

$$\text{Number of boys right-handed} = 48 \times \frac{33}{2} = 792$$

b)

$$\text{Total left-handed pupils} = 48 + 42 = 90 \quad (\text{corresponds to 5\% of pupils})$$

$$\text{Total pupils} = \frac{100}{5} \times 90 = 1800$$

$$\text{Total number of boys} = 792 + 48 = 840$$

$$\text{Total number of girls} = 1800 - 840 = 960$$

$$\text{Ratio of number of girls to number of boys to total number} = 960 : 840 : 1800$$

$$\rightarrow 8 : 7 : 15 \quad (\text{divided by 120})$$

c)

Number of right-handed boys remain the same while total number of pupils increased, as such, percent of right-handed boys decreased.

Ans: (a) 792

(b) 8 : 7 : 15

(c) decreased

17. a)

Number of triangles in first row = $4 + 3 + 4 + 3 + 1 + 1 = 16$

Total triangles = $16 \times 4 = 64$

b)

Total area = $64 \times 36 = 8 \times 8 \times 6 \times 6 = (8 \times 6) \times (8 \times 6) = 48 \times 48 \text{ cm}^2$

Length of square = 48 cm

Perimeter = $48 \times 4 = 192 \text{ cm}$

Ans: (a) 64

(b) 192 cm

For questions 6 to 17, show your working clearly and write your answers in the spaces provided. The number of marks available is shown in brackets [] at the end of each question or part-question. (45 marks)

- 6 The thickness of a dictionary was $\frac{1}{8}$ of the height of a table. The height of 3 such tables when stacked on top of one another was $\frac{21}{8}$ m.
- What is the total thickness of 2 such dictionaries?

Ans: _____ [3]

- 7 At a pet shop, $\frac{1}{4}$ of the animals were cats, 45% of the animals were dogs, 18% of the animals were rabbits and the rest were hamsters. There were 24 hamsters. How many animals were there at the pet shop?

Ans: _____ [3]

- 8** A machine could produce 120 000 boxes of chocolates in 6 hours. After the machine was improved and upgraded, the machine can now produce 9000 more boxes of chocolates in every 2 hours. At this new rate, how many boxes of chocolates does the machine produce in one hour?

Ans: _____ [3]

- 9** A tank measuring 35 cm long and 25 cm wide was filled with water to a height of 0.18 m. When 2.6 l of water was added into the tank, 850 ml of water overflowed from the tank. What was the capacity of the tank?

Ans: _____ [3]

- 10 Mr Chua bought 3 identical pairs of socks and less than 5 identical pairs of shoes. The total cost of the socks was \$75 and the average price of all the items that he had bought was \$78.60. The total amount that he had spent on the shoes was a whole number in dollars.

- (a) How many pairs of shoes did he buy?
- (b) What was the average price of the shoes?

Ans: (a) _____ [1]

(b) _____ [2]

- 11 Wei Yan had some marbles at first. He gave $\frac{3}{8}$ of them to his friends and $\frac{5}{7}$ of the remaining marbles to his brother. His cousin then gave him 408 marbles. In the end, he had twice as many marbles as he had at first. How many marbles did Wei Yan have at first?

Ans: _____ [4]

12. At a concert, 45% of the people were adults and $\frac{1}{5}$ of the remaining people were girls. There were 660 more boys than girls. How many people were at the concert?

Ans: _____ [4]

- 13** A baker baked 300 cookies. 60% of the cookies baked were chocolate chip cookies and the rest were lychee cookies. Some of the chocolate chip cookies were sold and now the percentage of the chocolate chip cookies decreased to 40% of the remaining cookies. How many chocolate chip cookies were sold?

Ans: _____ [4]

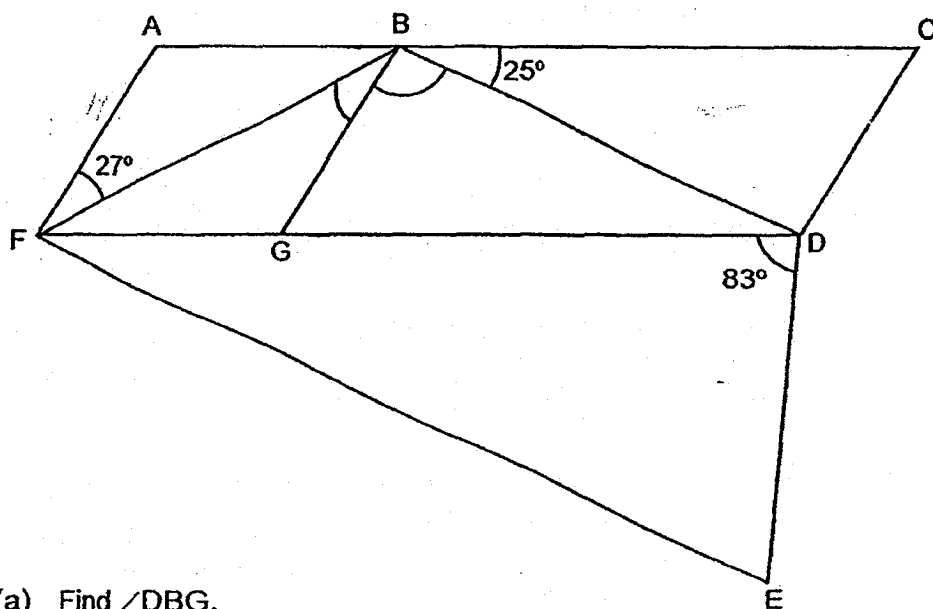
- 14 Amy had $\$10y$. She had $\$24$ less than Cindy. Linda had half as much as Amy. They bought a present which cost $\$(4y+5)$ for their friend.

- (a) How much did they have altogether at first? Give your answer in terms of y in the simplest form.
- (b) If $y = 7$, how much did they have left in total after buying the present?

Ans: (a) _____ [2]

(b) _____ [2]

- 15 In the figure, ABGF is a rhombus, BCDG is a parallelogram and BDEF is a trapezium. ABC and FGD are straight lines and BD is parallel to FE. $\angle AFB = 27^\circ$, $\angle CBD = 25^\circ$ and $\angle GDE = 83^\circ$.



- (a) Find $\angle DBG$.
 (b) Find $\angle DEF$.

Ans: (a) _____ [2]

(b) _____ [2]

- 16** The table below shows the number of pupils who are left-handed in a school. The number of pupils who are right-handed is not shown in the table. The ratio of the number of boys who are left-handed to the number of boys who are right-handed is 2 : 33.

	Left-handed	Right-handed
Boys	48	
Girls	42	

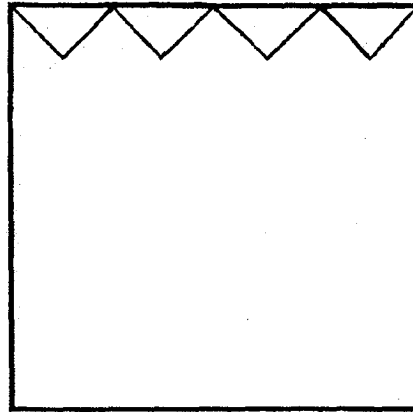
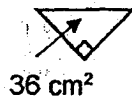
- (a) How many boys are right-handed?
- (b) 95% of the pupils are right-handed. What is the ratio of the number of girls to the number of boys to the total number of pupils? Give your answer in the simplest form.
- (c) Some girls are then transferred into the school from another school. Did the percentage of boys who are right-handed increase, decrease or remain the same compared to the total number of pupils?

Ans: (a) _____ [1]

(b) _____ [3]

(c) _____ [1]

- 17 Mrs Lau had some cloth which she had cut into identical right-angled isosceles triangles. Each triangular piece of cloth had an area of 36 cm^2 . She then sewed these triangles onto the square piece of cloth as shown below.



She continued to sew these triangular pieces of cloth onto the square piece of cloth without any overlaps. No part of any of the triangular piece of cloth was outside of the square piece of cloth.

- (a) How many of such triangular pieces of cloth did she sew to cover 1 face of the square piece of cloth **completely**?
- (b) What is the perimeter of the square piece of cloth?

Ans: (a) _____ [2]

(b) _____ [3]

End of Paper