Year 6 Term 1 Homework Solutions

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2   Year 6 Term 1 Week 2 Homework Solutions

2.1   Topic 1 — Numerals

Exercise 2.1.1

1. *Five times the square root of 49 is increased by the quotient of 36 and 9.*

   Solution:
   $$5 \times \sqrt{49} + 36 \div 9 = 5 \times 7 + 4 = 39.$$

2. *Evaluate $\frac{3}{8} \times 2.5 - \frac{3}{16} \div 1.5$*

   Solution:
   $$\frac{3}{8} \times 2.5 - \frac{3}{16} \div 1.5 = \frac{3}{8} \times 2\frac{1}{2} - \frac{3}{16} \times \frac{2}{3} = \frac{15}{16} - \frac{1}{8} = \frac{13}{16}.$$

3. *Evaluate $0.5 + 3\frac{1}{2} - 0.25 \times \frac{1}{3}$*

   Solution:
   $$\frac{1}{2} + 3\frac{1}{2} - \frac{1}{4} \times \frac{1}{3} = 4 - \frac{1}{12} = 3\frac{11}{12}.$$

4. *Find the value of $\frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \frac{1}{8 \times 9} + \frac{1}{9 \times 10}$*

   Solution:
   $$\frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8} + \frac{1}{8 \times 9} + \frac{1}{9 \times 10}$$
   $$= \frac{1}{5} - \frac{1}{6} + \frac{1}{6} - \frac{1}{7} + \frac{1}{7} - \frac{1}{8} + \frac{1}{8} - \frac{1}{9} + \frac{1}{9} - \frac{1}{10} = \frac{1}{10}.$$

5. *If $\begin{vmatrix} 1 & \bigstar & 3 \\ 2 & \bigstar & 4 \end{vmatrix} = 1 \times 4 - 2 \times 3$, then $\begin{vmatrix} 3 & \bigstar & 5 \\ 4 & \bigstar & 6 \end{vmatrix} - \begin{vmatrix} 2 & \bigstar & 4 \\ 3 & \bigstar & 5 \end{vmatrix}$.*

   Solution:
   $$(3 \times 6 - 4 \times 5) - (2 \times 5 - 3 \times 4) = 2 - (-2) = 0.$$

6. *When 5 is multiplied by a fraction, the answer is 0.5 greater than $\frac{1}{3}$. What is the fraction?*

   Solution:
   $$5 \times N = \frac{1}{3} + 0.5, \ \Rightarrow \ 5 \times N = \frac{5}{6}, \ \Rightarrow \ N = \frac{1}{6}.$$

7. *Mayan numerals consisted of dots and strokes representing the numbers up to 20. For example: 4 was $\bullet \, \bullet \, \bullet \, \bullet$, 5 was _____ , 8 was $\underline{\bullet \, \bullet \, \bullet}$. Write the number 14 as a Mayan numeral.*

   Solution:
   $$\underset{\underline{\underline{}}}{\bullet \ \bullet \ \bullet \ \bullet}$$

8. *In the expression $\square \bigstar \triangle$ the symbol $\bigstar$ means 'Double the first number and to the result then add the second number'. For example: $4 \bigstar 5 = 4 \times 2 + 5 = 13$. Find the value of $6 \bigstar 5$.*

   Solution:
   $$6 \times 2 + 5 = 17.$$

2.2   Topic 2 — Order of Operations

Exercise 2.2.1

1. *Evaluate the following:*

    (a) $5 + 12 \div (4 + 2) - 3 =$ $[= 5 + 12 \div 6 - 3 = 4]$.

    (b) $100 - \{80 - [60 - (40 - 20)]\} =$ $[= 100 - (80 - 40) = 60]$.

    (c) $[25 \div (2 + 3)] + 12 =$ $[= 25 \div 5 + 12 = 17]$.

    (d) $(3 + 5) \times [21 - (8 + 9)] =$ $[= 8 \times 4 = 32]$.

    (e) $24 \div 3 \times 4 + 6 \times 2 + 8 =$ $[= 8 \times 4 + 12 + 8 = 52]$.

2. *Find the missing numbers:*

    (a) $200 - (20 + \square) \times \square = 44$ $\square =$ $[= 6]$.

    (b) $23.76 \div (2.8 + \square) + 1.4 = 6.8$ $\square =$ $[= 1.6]$.

    (c) $(\square - 1.06) \times 0.31 = 2.914$ $\square =$ $[= 10.46]$.

    (d) $2\frac{2}{5} - \frac{3}{4} \div \frac{1}{\square} = \frac{13}{20}$ $\square =$ $[= 2\frac{1}{3}]$.

    (e) $\left(\square - \frac{3}{4}\right) \div \frac{5}{12} = \frac{3}{10}$ $\square =$ $[= \frac{7}{8}]$.

3. *I think of a number, square it, halve it, triple it, divide by 4 and I left with 54. What is the number I first thought of?*

    Solution: $N^2 \div 2 \times 3 \div 4 = 54, \Rightarrow N^2 = 54 \times 4 \div 3 \times 2 = 144 \therefore N = 12$.

4. *If $A \triangle B = A \times B - A \div B$, Find $4 \triangle 3$.*

    Solution: $4 \times 3 - 4 \div 3 = 10\frac{2}{3}$.

5. *If $\{A, B\} = A \times 3 + \frac{B}{3}$, then $\{\square, 2\} = 3\frac{3}{4}$. Find the missing number.*

    Solution: $N \times 3 + \frac{2}{3} = 3\frac{3}{4} \Rightarrow N = \left(3\frac{3}{4} - \frac{2}{3}\right) \times \frac{1}{3} = 1\frac{1}{36}$.

6. *If $A \bigstar B = (A \times 2 + B) \times \frac{1}{2}$, then $\square \bigstar \frac{1}{3} = \frac{2}{3}$. Find the missing number.*

    Solution: $\left(N \times 2 + \frac{1}{3}\right) \times \frac{1}{2} = \frac{2}{3} \Rightarrow N = \left(\frac{2}{3} \times 2 - \frac{1}{3}\right) \times \frac{1}{2} = \frac{1}{2}$.

2.3   Topic 3 — Number Patterns

2.3.1   Arithmetic Sequence

> **Definition:** A sequence is an arithmetic sequence if the difference between any two consecutive terms is the same constant number.
>
> **For Example:** 4, 7, 10, 13, 16, . . . This sequence has a constant difference of 3.

Exercise 2.3.1 Arithmetic Sequences:

1. *What is the next number of the sequence? 3, 7, 11, 15, 19,*

Solution:	$a = 3$ *and* $d = 4,$ $\Rightarrow$ *Next number is,* $19 + 4 = 23$

2. *What is the next number of the sequence? 5.1, 5.4, 5.7, 6.0, 6.3,*

Solution:	$a = 5.1$ *and* $d = 0.3,$ $\Rightarrow$ *Next number is* $6.3 + 0.3 = 6.6$

3. *What is the next number of the sequence? 3, $3\frac{1}{3}$, $3\frac{2}{3}$, 4 , $4\frac{1}{3}$,*

Solution:	$a = 3$ *and* $d = \dfrac{1}{3}$ $\Rightarrow$ *Next number is* $4\dfrac{1}{3} + \dfrac{1}{3} = 4\dfrac{2}{3}$

4. *For the sequence given below, what is the 20th term of the sequence?*

   3, 5, 7, 9, 11, 13 . . . .

Solution:	$a = 3,$ *and* $d = 2$ $\Rightarrow$ $a + (n-1)d = 3 + (20-1) \times 2 = 41$
	The 20th number is 41

5. *Consider the arithmetic sequence given below: 3, 8, 13, 18, 23, ... Which term of the sequence is 108?*

Solution:	$a = 3$ *and* $d = 5$ $\Rightarrow$ $a + (n-1) \times d = 108$
	$3 + (n-1) \times 5 = 108$ $\Rightarrow$ $3 + 5n - 5 = 108,$ $\Rightarrow$ $5n = 108 + 2$ $\Rightarrow$ $n = 22nd$

2.3.2   Geometric Sequence

> **Definition:** The Geometric sequence is obtained by the multiply of a constant non-zero number, which has the same quotient between consecutive terms.
>
> **For Example:** 5, 10, 20, 40, 80, 160, 320, ... This sequence has a constant quotient of 2 between consecutive terms.

Exercise 2.3.2 Geometric Sequences:

1. *What is the next number of the sequence? 4, 12, 36, 108,*

   > **Solution:** $\qquad a = 4, \; r = 3 \; \Rightarrow \; Next \; number \; is \; 108 \times 3 = 324.$

2. *Find the missing number. 2, 6, 18, _____ , 162, 486, . . .*

   > **Solution:** $\qquad a = 2, \; r = 3, \; \Rightarrow \; The \; missing \; number \; is \; 18 \times 3 = 54.$

3. *What is the next number of the sequence? 1000, 500, 250, 125,*

   > **Solution:** $\qquad a = 1000, \; r = \dfrac{1}{2}, \; \Rightarrow \; Next \; number \; is \; 125 \times \dfrac{1}{2} = 62.5$

4. *Consider the following geometric sequence 5, 15, 45, 135, . . . Which term of the sequence equals 3645?*

   > **Solution:** $\quad a = 5 \; r = 3 \; \Rightarrow \; ar^{n-1} = 3645$
   >
   > $\qquad\qquad 5 \times 3^{n-1} = 3645 \; \Rightarrow \; 3^{n-1} = 729 \; \Rightarrow \; 3^6 = 729, \; \Rightarrow \; n = 7th$

5. *In a certain geometric sequence, if the first term is 3 and the fifth term is 1875, what is the middle term?*

   > **Solution:** $\quad Fifth \; term \; is \; 3 \times N^4 = 1875, \; \Rightarrow \; N = \sqrt[4]{1875 \div 3} = 5 \; third \; term \; 3 \times 5^2 = 75$

2.4   Topic 4 — Ratio and Rate

Exercise 2.4.1

1. *The perimeter of a rectangle is 72 cm. The ratio of its breadth to its length is 1:5. What is the area of the rectangle?*

Solution:	$W : L = 1 : 5 \ \Rightarrow \ 72 \div \{(1 + 5) \times 2\} = 6 \, cm/unit.$
	$L = 6 \, cm \ and \ W = 5 \times 6 = 30 \, cm, \ \therefore \ A = 6 \times 30 = 180 \, cm^2.$

2. *Linda is 12 years old. The ratio of her age to her sister's is 3 : 5. Find the total age of the girls.*

Solution:	$L : S = 3 : 5 = 12 : S \ \Rightarrow \ 3 \times S = 5 \times 12 \ \Rightarrow \ S = 20, \Rightarrow \ Total \, age = 32 \, years.$

3. *The ratio of girls and boys in a school hall is 5 : 7. If there are 595 boys in the hall, how many more boys are there than girls?*

Solution:	
	$G : B = 5 : 7 = G : 595 \ \Rightarrow \ G = 595 \times 5 \div 7 = 425, \Rightarrow \ B - G = 595 - 425 = 170 \, more.$

4. *The ratio of the number of bookmarks David has to the number of Jason has is 4 : 3. When David gives 25 bookmarks to Jason, he still has 8 bookmarks more than Jason. How many bookmarks does David have at the beginning?*

Solution:	$D : J = 4 : 3; \ the \ difference = 4 - 3 = 1 \ unit = 25 \times 2 + 8 = 58.$
	$\therefore David \ has \ 58 \times 4 = 232 \, bookmarks.$

5. *A motorist covered $\frac{3}{5}$ of a journey in 5 hours at an average speed of 90 km/h. He completed the whole journey at an average speed of 75 km/h.*

   (a) *Find the total distance of the whole journey.*

Solution:	$5 \ hours \ coved \ 5 \times 90 = 450 \, km \ \Rightarrow \ Total \ distance = 450 \times \dfrac{5}{3} = 750 \, km.$

   (b) *What was the average speed of the last $\frac{2}{5}$ of the journey?*

Solution:	$The \ time \ for \ the \ whole \ journery = 750 \div 75 = 10 \, hrs.$
	$The \ speed \ for \ the \ rest \ journery = (750 - 450) \div 5 = 60 \, km/h.$

2.5   Problem Solving (Word Equations)

Exercise 2.5.1

1. *The numbers 2, 3, 7, 8 and 9 are to be placed in the squares A, B, C, D and E to give the correct multiplication. What number is placed in square D?*   *Answer:* $[\,39 \times 2 = 78, \Rightarrow\ D = 7\,]$.
   $[\,29 \times 3 = 87, \Rightarrow\ D = 8\,]$.

$$
\begin{array}{r}
\boxed{A}\ \ \boxed{B} \\
\times \qquad\ \ \boxed{C} \\
\hline
\boxed{D}\ \ \boxed{E}
\end{array}
$$

2. *The numbers 1, 2, 3, 5 and 8 are to be placed in the squares A, B, C, D and E to give the correct multiplication. What number is placed in square A?*   *Answer:* $[\,38 \times 4 = 152, \Rightarrow\ A = 3\,]$.

$$
\begin{array}{r}
\boxed{A}\ \ \boxed{B} \\
\times \qquad\ \ \boxed{4} \\
\hline
\boxed{C}\ \ \boxed{D}\ \ \boxed{E}
\end{array}
$$

3. *The letters A and B represent two different numbers below, What is the difference between letters A and B ?*
   Answer: $[\,A = 3, B = 1,\ \Rightarrow\ A - B = 2]$.

$$
\begin{array}{r}
\boxed{A}\ \ \boxed{4} \\
\boxed{4}\ \ \boxed{A} \\
+\ \ \boxed{A}\ \ \boxed{4} \\
\hline
\boxed{B}\ \ \boxed{B}\ \ \boxed{B}
\end{array}
$$

4. *What value of A must be in the boxes to make the number statement true?*
   Answer: $[\,A = 8\,]$.

$$
\frac{\boxed{A}\ +\ 3}{\boxed{A}\ -\ 2} = \frac{\boxed{A}\ +\ 14}{\boxed{A}\ +\ 4}
$$

2.6 Test Paper 2

Part A —- 10 multiple Choice Questions (1 mark each)

Question 1 . . . . (1 mark)

Which one of the following numbers is largest?

A. 0.8088   B. 0.8008   C. 0.0808   **D. 0.8808**

Question 2 . . . . (1 mark)

Select the fraction which is closest to $2\frac{3}{4}$.

A. $2\frac{25}{11}$ B. $\frac{32}{15}$ **C. $\frac{58}{21}$**   D. $\frac{255}{100}$

Question 3 . . . . (1 mark)

Which one of the following has the largest value?

A. $\frac{1}{2} \times 35$ B. $\frac{1}{2} \div 35$ C. $35 \times \frac{1}{2}$ **D. $35 \div \frac{1}{2}$**

Question 4 . . . . (1 mark)

Which of these fractions is equal to $\frac{2}{3}$?

A. $\frac{2+1}{3+1}$ B. $\frac{2-1}{3-1}$ **C. $\frac{2 \div 5}{3 \div 5}$**   D. $\frac{2 \times 2}{3 \times 3}$

Question 5 . . . . (1 mark)

What value of A should be written in the box to make a fraction $\frac{15}{\boxed{A}}$ whose value is between 3 and 4?

A. 3   **B. 4**   C. 5   D. 6

Question 6 . . . . (1 mark)

A fraction is added to 0.25, the sum is divided by $\frac{3}{4}$ and the answer is 2. What is the fraction?

A. $1\frac{1}{4}$ B. $\frac{2}{5}$ C. $1\frac{5}{21}$ D. $2\frac{5}{12}$

Question 7 . . . . (1 mark)

The total bus fare for 2 adults and 3 children is $15.00. If the children's fare was $1.56 each, how much is each adult fare?

A. $3.56   B. $8.26   **C. $5.16**   D. $6.16

Question 8 . . . . (1 mark)

How long will it take Kevin to walk 3 kilometres if he walks 40 metres in 30 seconds?

A. 35 minutes   **B. 37.5 minutes**   C. 2100 seconds   D. 235 minutes

Question 9 . . . . (1 mark)

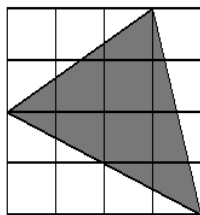Which statement is not true?

A. 12 - 8 < 8 - 3   B. $3 \times 5 = 5 \times 3$ C. $12 \div 2 = 12 \times \frac{1}{2}$ **D. 15 - 7 >** 4×3

Part B — 10 Average Questions (2 marks each)

Question 10 . . . . (2 marks)

Find the area of the shaded triangle if each square represents $1\ cm^2$

Solution:	$4 \times \left(\dfrac{1}{2} \times 2 \times 3 + \dfrac{1}{2} \times 1 \times 4 + \dfrac{1}{2} \times 2 \times 4 \right) = 7\,cm^2.$

Question 11 . . . . (2 marks)

A baker uses 12 eggs to bake two cakes. Find the number of eggs he needs to bake 21 cakes.

Solution:	$12 : 2 = E : 21; \Rightarrow 2E = 12 \times 21 \Rightarrow E = 126\,\text{eggs}.$

Question 12 . . . . (2 marks)

The volume of a cube is $343\ cm^3$. Find the total surface area of four of such cubes.

Solution:	$\sqrt[3]{343} = 7\,cm, \Rightarrow$ each face has a area of $7^2 = 49\,cm^2.$
	Total Surface Area $= 6 \times 49 \times 4 = 1176\,cm^2.$

Question 13 . . . . (2 marks)

From a $1\frac{3}{4}$ litre kettle, cups containing 250 mL are filled. If 35 cups are fill, how many times did the full kettle boil?

Solution:	Total water need: $= 250 \times 35 = 8750ml$
	Each kettle contains $1\dfrac{3}{4}\,L = 1750\,mL.$
	Number of full kettls need to be boiled: $= 8750 \div 1750 = 5\,\text{times}.$

Question 14 . . . . (2 marks)

A teacher gives her students half an apple each in the morning and another quarter of an apple each in the afternoon. She has to cut 21 apples to do this. How many students does she have in her class?

Solution:	Each student has: $\dfrac{1}{2} + \dfrac{1}{4} = \dfrac{3}{4}$ apple, $\Rightarrow$ Number of students are $21 \div \dfrac{3}{4} = 28\,\text{students}.$

Question 15 . . . . (2 marks)

Rebecca has 15 bottles of cooking oil. 2 of them has a capacity of 5 litres each and the rest has a capacity of 2.5 litres each. How much oil does Rebecca have altogether?

> **Solution:**
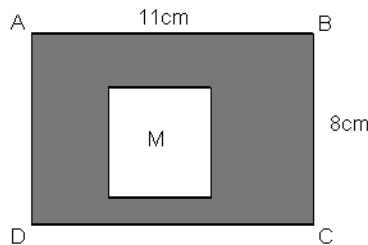> $$2 \times 5 + (15 - 2) \times 2.5 = 42.5 \, Litres.$$

Question 16 . . . . (2 marks)

If $2\frac{1}{4}$ kg of grapes cost \$6.30, find the cost of 500 g.

> **Solution:**
> $$2\frac{1}{4} : \$6.30 = \frac{1}{2} : \$M, \Rightarrow 2\frac{1}{2} \times M = 6.30 \times \frac{1}{2}, \Rightarrow M = \$1.40.$$

Question 17 . . . . (2 marks)

A square M is cut off from a rectangular cardboard, ABCD. The area of the shaded part is 63 cm^2. Find the perimeter of the square M.

> **Solution:**
> The area of the square M: $= 11 \times 8 - 63 = 25 \, cm^2; \Rightarrow P = 5 \times 4 = 20 \, cm.$

Question 18 . . . . (2 marks)

Suppose all the counting numbers are written in columns in the pattern shown below:

A	B	C	D	E	F
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15			

Which column does 100 appear?

> **Solution:**
> $$100 \div 7 = 14R4 \Rightarrow \text{Column D.}$$

Question 19 . . . . (2 marks)

If $\triangle\triangle\bigstar$ stands for 11 and $\triangle\bigstar\bigstar\bigstar$ stands for 13, what does $\triangle\triangle\triangle\bigstar\bigstar$ stand for?

> **Solution:**
> $\triangle = 4, \bigstar = 3, \Rightarrow \triangle\triangle\bigstar = 4 \times 2 + 3 = 11,$
> $\triangle\bigstar\bigstar\bigstar = 4 + 3 \times 3 = 13,$
> Therefore $\triangle\triangle\triangle\bigstar\bigstar = 4 \times 3 + 3 \times 2 = 18.$

Part C — 10 Extension Questions (3 marks each)

Question 20 . . . . (3 marks)

A water tank was $\frac{2}{5}$ full of water. Peter poured 1.5 Litres of water into the tank which then became $\frac{7}{10}$ full. How much water was in the water tank at first?

Solution:	The water added to the tank $= \dfrac{7}{10} - \dfrac{2}{5} = \dfrac{3}{10} = 1.5\,L$
	$\dfrac{1}{10}$ of the whole tank $= 0.5\,L$
	So $\dfrac{2}{5}$ of the tank $= \dfrac{4}{10}$ of the tank $= 4 \times 0.5 = 2\,L$.

Question 21 . . . . (3 marks)

Two cars are travelling towards each other. One is travelling at 60 km/h and the other at 90 km/h. How far apart are they 5 minutes before they meet?

Solution:	They are combite speed is: $= 60 + 90 = 150\,km/h$;
	$\Rightarrow$ distance apart: $= \dfrac{5}{60} \times 150 = 12.5\,km/h$.

Question 22 . . . . (3 marks)

15 books cost an average of \$5.95. If 10 of them cost an average of \$6.15, what is the total cost of the rest of the books?

Solution:	$15 \times \$5.95 - 10 \times \$6.15 = \$27.75$.

Question 23 . . . . (3 marks)

During a clearance sale, Rebecca bought 4 shirts at \$15 each, 3 skirts at \$21 each and 2 pairs of shoes at \$23 each. How much change would she get if she paid the cashier with 4 \$50 notes?

Solution:	$4 \times \$50 - (4 \times \$15 + 3 \times \$21 + 2 \times \$23) = \$31.00$.

Question 24 . . . . (3 marks)

$\frac{2}{11}$ of a basket of 132 eggs are bad. If $\frac{1}{3}$ of the remaining eggs are sold, how many good eggs are left?

Solution:	Good eggs $= \dfrac{9}{11} \times 132 = 108, \Rightarrow \dfrac{1}{3}$ are sold and $\dfrac{2}{3}$ are left.
	Therefore $\Rightarrow \dfrac{2}{3} \times 108 = 72$ good eegs are left.

Question 25 . . . . (3 marks)

Jessica has some 10c , 20c and 50 c coins in her piggy bank. Altogether she has 14 coins, and the total value of the coins is $3. If she has more 10c than 20c coins and more 20c than 50c coins, how many 50c coins does she have?

Solution:

Three 50 ¢conis $(7 \times 10¢ + 4 \times 20¢ + 3 \times 50¢ = 300¢ = \$3.00)$

Question 26 . . . . (3 marks)

The ratio of the cost of a bottle of orange juice to that of a bottle of soft drink is 5 : 3. If the bottle of orange juice costs $1.50 more, what is the average cost of 5 bottles of orange juice and 5 bottles of soft drink?

Solution:

Orange juice : Soft drink = 5 : 3; Soft drink + $1.50 : Soft drink = 5 : 3;

Sofe drink = $2.25; and Orange juice = $2.25 + $1.5 = $3.75

Therefore, the average cost: $= (5 \times 3.75 + 5 \times 2.25) \div 10 = \$3.00$

Question 27 . . . . (3 marks)

Bob spends 60% of his pocket money every week and saves the rest. How much will he spend in 3 weeks if he saves $16.40 in 2 weeks?

Solution:

Spend 60%, save 40%, each week saving: $= \$16.40 \div 2 = \$8.20$;

Each week spend: $= \$8.20 \div 4 \times 6 = \$12.30$;

spend in three weeks: $= 3 \times \$12.3 = \$36.90$:

Question 28 . . . . (3 marks)

A worker was paid at the rate of $16.5 per hour. How much would 12 such workers be paid for 8 hours of work for 4 weeks? [Note: Each week contains five working days.]

Solution:

$16.5 \times 8 \times 5 \times 12 \times 4 = \$31,680$

Question 29 . . . . (3 marks)

The ratio of the perimeter of a rectangle to that of a square is 11:4. If one side of the square is 5cm, find the total perimeter of the 2 figures.

Solution:

The perimeter of the square $= 4 \times 5 = 20\,cm$

$R : S = 11 : 4; \Rightarrow R : 20 = 11 : 4$

$R = 20 \times 11 \div 4 = 55\,cm; \Rightarrow$ Total perimeter is: $= 55 + 20 = 75cm$:

Part D — 8 Challenging Questions (5 marks each)

Question 30 . . . . (5 marks)

Farmer John is going to grow a row of carrots. He plants the first carrot at the point A, then plants the next carrot one metre to the left of point A and then plants the next carrot one metre to the right of A. The fourth carrot will be planted 2 metre to the left of A and so on.
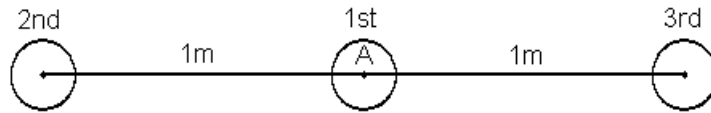
(a) Where will John plant his 100th carrot?   [1]

> **Solution:**   (1m, 1m, 2m, 2m, 3m, 3m, . . . 49m, 49m, 50m, 50m)
>
> $\Rightarrow$ It is 50 m from the first one.

(b) What is the distance between the 99th carrot and the 100th carrot?   [2]

> **Solution:**   49 m left + 50 m right = 99 m.

(c) Assuming that John has been walking around to plant every carrot, by the time John has planted the 100th carrot, how far has he walked?   [2]

> **Solution:** $99 \times 50 = 4950.$

Question 31 . . . . (5 marks)

The average weight of Lee and Joe is 58.5 kg. The average weight of Lee and Jack is 56 kg. If Lee is 2.8 kg heavier than Jack, what is Joe's weight?

> **Solution:**   Lee's weight $= (56\,kg \times 2 + 2.8\,kg) \div 2 = 57.4\,kg;$
>
> Joe's weight $= 2 \times 58.5 - 57.4 = 59.6\,kg$

Question 32 . . . . (5 marks)

After a birthday party, Jason, Jessica and Stephanie shared some lollipops in the ratio 3 : 6 : 8 respectively. If Jason and Jessica have 45 lollipops in all, how many lollipops has Stephanie more than Jason?

Solution: The total share of Jason and jessica is: $3 + 6 = 9; \Rightarrow 45 \div 9 = 5$ for each share

The different between Jason's share and Stepnanie's share is: $8 - 3 = 5;$

Therefore, Stephanie will have $5 \times 5 = 25$ lollipops more than jason.

Question 33 . . . . (5 marks)

Daniel has three different sizes of marble collections. 75% of the marbles are medium-sized. The rest are large and small in the ratio of 2 : 3 respectively. There are 200 more small marbles than large marbles. How many more medium-sized marbles than small ones are there in Daniel's collections?

Solution: The medium sized marbles are 75% Rest of them are 25% in the ratio of 2:3;

So 10% are large and 15% are small.

The different between the samll and large is 200 for each part or ervry 5%;

The different between the medium sized and samll sized is 75% -15% = 60%;

Therefore, the number of medium sized marble is $60 \div 5 \times 200 = 2400$.

Question 34 . . . . (5 marks)

A dining table and 8 chairs cost \$2,500. The dining table and 6 chairs cost \$2,250.

(a) Find the cost of 12 such chairs.   [3]

Solution:

The differece betwween a set of 1 table and 8 chairs and a set of 1 table and 6 chairs is 2 chairs

The cost of these two set is : $\$2500 - \$2250 = \$250.$

Each chair is $250 \div 2 = \$125; \Rightarrow$ so 12 chairs cost $12 \times \$125 = \$1500$:

(b) Find the cost of two dining tables.   [2]

Solution: A dining table costs: $\$2500 - 8 \times \$125 = \$1500;$

Therefore, two dining tables cost: $\$1500 \times 2 = \$3000.$

Question 35 . . . . (5 marks)

Town A is 416 km from Town B. Johnson travelled from town A at an average speed of 84 km/h for $2\frac{2}{3}$ hours. He then decreased his speed by 20 km/h for the rest of the journey.

(a) How long did he take to complete the whole journey? [2]

> **Solution:**
>
> The distance of the rest of of journey is: $416 - 84 \times 2\frac{2}{3} = 192\,km$.
>
> The time taken for the rest of the journey is: $192 \div (84 - 20) = 3\,\text{hours}$.
>
> The time taken for the whole journey is: $2\frac{2}{3} + 3 = 5\frac{2}{3}\,\text{hours}$.

(b) What was his average speed for the whole journey? [3]

> **Solution:**
>
> the average speed of the whole journey is: $416 \div 5\frac{2}{3} = 73\frac{7}{17}\,km/h$.

Question 36 . . . . (5 marks)

The ratio of the number of female spectators to the number of male spectators in a New Year event was
7 : 10. When 240 male spectators jointed in later, there was 20% increased in the number of male spectators. What is the total number of spectators in the New Year event after the increase?

> **Solution:**
>
> Female : Male $= 7 : 10, \Rightarrow\ 20\%$ of 10 parts $= 240$
>
> Each part of male is 120
>
> After increase, Female : Male $= 7 : 12$,
>
> The etotal number of spectators: $= (7 + 12) \times 120 = 2280$.

Question 37 . . . . (5 marks)

Ken's salary in 2006 was \$52,000. He saved 25% of the salary and spent the rest. The following year in 2007, his salary increased by 15% but his expenditure went up by 5%. How much less did Ken save in 2007?

> **Solution:**
>
> In 2006 Ken's saving was: $\$52,000 \times 25\% = \$13,000$
>
> In 2007 Ken's salary was: $\$52,000 \times 115\% = \$59,800$
>
> In 2007 Ken's saving was: $\$59,800 \times 20\% = \$11,960$
>
> Therefore Ken's saving was decreased by $\$13,000 - \$11,960 = \$1,040$