

Year 6 Term 1 Homework Solutions

Student Name: _____	Grade: _____
Date: _____	Score: _____

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1 Year 6 Term 1 Week 1 Homework Worked Solutions

1.1 Topic 1 — Numerals

1. Write in Roman numerals for the numbers given below:

(a) $99 =$ [Answer: *XCIX*].

(b) $479 =$ [Answer: *CDLXXIX*].

(c) $999 =$ [Answer: *CMXCIX*].

(d) $1993 =$ [Answer: *MCMXCIII*].

(e) $2008 =$ [Answer: *MMVIII*].

2. Write in Hindu-Arabic numerals :

(a) *CCCLIV* = [Answer: 354].

(b) *DCCLXXXVII* = [Answer: 787].

(c) *MMCCCXCIX* = [Answer: 2399].

(d) *DCCCLXXIV* = [Answer: 874].

(e) *MCMLXXXVIII* = [Answer: 1988].

3. 500 thousands, 50 tens and 15 ones written as a numeral is [Answer: 500,515].

4. 569321 rounded to the nearest ten thousand is [Answer: 570,000].

5. $123 \times$ [Answer: 38]. = 4674. Find the missing number.

6. Find the total surface area of a cube with edges 5 cm long. [Answer: 150 cm^2].

7. Consider the number 57359, what is the difference in the values of two 5's?

Solution:

$$50,000 - 50 = 49,950.$$

8. What is the value of the 8 in the number 345.678 . [Answer: 8 thousandths].

9. It takes $2\frac{1}{2}$ seconds for an electric saw to cut through a log of wood. How many seconds would it take for the saw to cut the wood into 5 equal pieces?

Solution:

$$\text{Five pieces needs four cuts, } \rightarrow 4 \times 2\frac{1}{2} = 10 \text{ sec.}$$

1.2 Topic 2 — Order of Operations

1. Evaluate the following:

(a) $(3 \times 5) + 5 \times (2 + 3) =$ [Answer: $15 + 5 \times 5 = 40$].

(b) $[28 \div (3 + 4)] \times (4 + 7) =$ [Answer: $28 \div 7 \times 11 = 44$].

(c) $27 - 28 \div 4 =$ [Answer: $27 - 7 = 20$].

(d) $56 \div 8 \times 2 + 12 =$ [Answer: $7 \times 2 + 12 = 26$].

(e) $12 + 5 \times 7 + 8 =$ [Answer: $12 + 35 + 8 = 55$].

(f) $3 \times 12 \div 4 \times 5 \div 2 + 12 =$ [$36 \div 4 \times 5 \div 2 + 12 = 9 \times 5 \div 2 + 12 = 22.5 + 12 = 34.5$].

2. What must the value of A be to make the number sentences true?

(a) $3 \times (\boxed{A} - 1) + 2 \times \boxed{A} = 32$ A = [Answer: 7].

(b) $\boxed{A} \times (12 + \boxed{A}) = 21 \times \boxed{A} - 20$ A = [Answer: 4 or 5].

(c) $3 \times \boxed{A} + 5 = 23 + 2 \times (\boxed{A} - 5)$ A = [Answer: 8].

(d) $\boxed{A} \times 7 + \boxed{A} \times 12 = 133$ A = [Answer: 7].

3. Only one of the following statements is true. Which one is it?

A. $3 \times (4 + 6) = 3 \times 4 + 6$

B. $4 \times 6 + 7 \times 4 = 16 \times 14$

C. $2 \times 3 + 11 = 3 \times 4$

D. $3 \times 9 + 8 \times 3 = (8 + 9) \times 3$

4. Only one of the following equals 21. Which one is it?

A. $(2 + 3) \times (4 + 5)$

B. $(2 + 4) \times 4 + 5$

C. $3 + 2 \times (4 + 5)$

D. $2 \times 3 \times 4 + 5$

5. Which one of the following expressions equals 96?

A. $4 \times 9 + 3 \times 5$

B. $4 \times (9 + 3) \times 5$

C. $(4 \times 9 + 3) \times 5$

D. $4 \times (9 + 3 \times 5)$

6. When one of the following numbers is divided by 3, or 5 or 7, the remainder in each case is 1. Which number is it?

A. $1 \times 3 \times 5 + 7$

B. $3 \times 5 \times 7 + 1$

C. $1 \times 5 \times 7 + 3$

D. $7 \times 3 \times 1 + 5$

1.3 Topic 3 — Pattern Questions

1. Find the sum of all the counting numbers inclusive within the indicated limits:

(a) From 5 through to 90

Solution:

$$(5 + 90) \times \frac{90 - 4}{2} = 95 \times 43 = 4085.$$

(b) From 15 to 55

Solution:

$$(15 + 55) \times \frac{55 - 14}{2} = 70 \times \frac{41}{2} = 1435.$$

(c) From 1 to 200

Solution:

$$(1 + 200) \times \frac{200}{2} = 201 \times 100 = 20,100.$$

2. Find the sum of the following number patterns:

(a) $642 + 644 + 646 + \dots + 656 + 658$

Solution:

$$(642 + 658) \times \frac{9}{2} = 5850.$$

(b) $325 + 330 + 335 + \dots + 370 + 375$

Solution:

$$(325 + 375) \times \frac{11}{2} = 3850.$$

(c) $9 + 99 + 999 + \dots + 999,999$

Solution:

$$\begin{aligned} (10 + 100 + 1,000 + 10,000 + 100,000 + 1,000,000) - 6 &= 1,111,110 - 6 \\ &= 1,111,104. \end{aligned}$$

3. If your New Year's resolution is to put 1 cent into your savings on the first day of the year, 2 cents on the second day, 3 cents on the third day and so on for all 365 days of the year. How much money altogether will you have in your savings at the end of the year?

Solution:

$$(1 + 365) \times \frac{365}{2} = 66,795 \text{ cents or } \$667.95.$$

1.4 Topic 4 — The Unitary Method

The important part of the method is to find the value of **ONE** and then to use this value to answer the question.

Example 1.4.1 If four pens cost \$1.08, how much money would I need to buy 10 pens?

$$\begin{aligned}\therefore 4 \text{ pens cost } \$1.08 \\ \therefore 1 \text{ pen costs } \$1.08 \div 4 = \$0.27 \text{ each.} \\ \therefore 10 \text{ pens cost } \$0.27 \times 10 = \$2.70\end{aligned}$$

1. 35 trucks of similar size can carry a total of 3325 kg. How much can be carried by 25 trucks?

Solution:	One truck can carry $3325 \div 35 = 95 \text{ kg}$. 25 trucks can carry $95 \times 25 = 2375 \text{ kg}$.
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2. Gary paid \$10.56 for 8 packets of screws. How much would Gary pay for 20 packets of screws?

Solution:	One pack costs $10.56 \div 8 = \$1.32$. 20 packs cost $1.32 \times 20 = \$26.40$.
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3. 56 kg of wheat can be bought for \$12. How much would 3.5 kg cost?

Solution:	Each kg costs $12 \div 56 = \$\frac{3}{14}$. So 3.5 kg will cost $3.5 \times \frac{3}{14} = \0.75 . or 75 cents.
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4. A car takes 12 minutes to cover 15 km. At this rate, how long would it take to travel 135 km?

Solution:	One minute a car can travel $\Rightarrow 15 \div 12 = 1.25 \text{ km/min}$. It will take $135 \div 1.25 = 108$ minutes, or 1 hour 48 minutes.
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5. A factory manufactures 720 toys in half an hour. How long will it take to manufacture 2160 toys?

Solution:	Each hour it manufactures $720 \times 2 = 1440$ toys 2160 toys will take $2160 \div 1440 = 1.5$ hours or 90 minutes.
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1.5 Problem Solving (Working with Boundaries)

1. Palm trees are planted 3 metres apart along the boundary of a rectangular netball court with sides of 12 metres by 21 metres. How many palm trees are planted?

Solution:

$$P = (12 + 21) \times 4 = 66 \text{ m}$$
$$66 \div 3 = 22 \text{ palm trees planted.}$$

2. A local council wishes to put a 1.5 metre wide concrete path around a rectangular sports field. If the sports field measures 25 metres by 30 metres, what would be the total area of the concrete path?

Solution:

Out side area: $A_1 = (25 + 1.5 \times 2) \times (30 + 1.5 \times 2) = 924 \text{ m}^2$.

Sport field area: $A_2 = 25 \times 30 = 750 \text{ m}^2$.

So the concrete path: $A = A_1 - A_2 = 924 - 750 = 174 \text{ m}^2$.

3. A lawn is in the shape of a triangle with sides of 12 m, 20 m and 24 m. A stake is planted at four metres intervals along the perimeter of the lawn. If a sign is placed on each stake except those at the corners, how many signs are around the triangle?

Solution:

The perimeter: $P = 12 + 20 + 24 = 56 \text{ m}$

Because it is an enclosed shape, total number of stakes planted: $56 \div 4 = 14$.

Except three corners: $14 - 3 = 11$ stakes.

4. A path is built around a square garden. The path is the same width all the way around and its area is 40 m^2 . If the length of the garden is a whole number of metres, how wide is it?

Solution:

It can be 3 m by 3 m with 2 m wide path: $(3 + 2 \times 2)^2 - 3^2 = 40 \text{ m}^2$

or it can be 9 m by 9 m wide with 1 m path: $(9 + 1 \times 2)^2 - 9^2 = 40 \text{ m}^2$.

1.6 Test Paper 1

Part A — 10 Multiple Choice Questions (1 mark each)

Question 1 (1 mark)

 $5\frac{3}{5}$ is the same as:

- A. $\frac{28}{3}$ **B. $\frac{28}{5}$** C. $\frac{23}{5}$ D. $\frac{23}{3}$

Question 2 (1 mark)

If $\frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10} = \boxed{A} \times \frac{1}{10} + \frac{1}{2}$, what is the value A in the box?

- A. 2 **B. 3** C. 4 D. 5

Question 3 (1 mark)

Which one of the following has the largest answer?

- A. $\frac{1}{5} \times 15$ B. $\frac{1}{3} \times 6$ C. the number of quarters in 1 **D. the number of halves in 3**

Question 4 (1 mark)

How many quarters are there in $3\frac{3}{4}$?

- A. 12 B. 14 **C. 15** D. 18

Question 5 (1 mark)

123456 rounded to nearest hundred would be:

- A. 123000 B. 123400 C. 123450 **D. 123500**

Question 6 (1 mark)

How many pieces of string of length $\frac{1}{8}$ m can be cut from a roll of $6\frac{3}{4}$ m?

- A. 54** B. 45 C. 64 D. 46

Question 7 (1 mark)

Jessica wakes up at 6:30 a.m., takes 30 minutes to get dressed, 15 minutes to eat breakfast and 20 minutes to travel to school. What time does she get to school?

- A. 7:45 a.m. B. 7:30 a.m. C. 6:55 a.m. **D. 7:35 a.m.**

Question 8 (1 mark)

If $\frac{2}{5}$ of a number is 14, find the number.

- A. 35** B. 37 C. 65 D. 70

Question 9 (1 mark)

5 pens cost \$1.35. Which calculation gives the price of 3 pens?

- A. $(135 \div 3) \times 5$ B. $(135 \times 5) \div 3$ **C. $(135 \div 5) \times 3$** D. $(135 \div 5) \div 3$

Question 10 (1 mark)

In space arithmetic, 8 is written as *⊙, 10 is written as * ⊙ ⊙ and 14 is written as * * ⊙. How would 20 be written?

- A. * * ⊙ ⊙ ⊙ **B. * * * ⊙** C. * * ⊙ ⊙ D. * * * ⊙ ⊙ ⊙

Part B — 10 Average Questions (2 marks each)

Question 11 (2 marks)

If you can buy 8 pencils at \$1.60, what is the cost of 7 pencils?

Solution: $8 : \$1.60 = 7 : C, \Rightarrow c = (7 \times 1.6) \div 8 = \$1.40.$

Question 12 (2 marks)

Luke left home at 8:35 a.m and came home at 5:18 p.m. How long was he away from home?

Solution: $12 : 00 + 5 : 18 - 8 : 35 = 8 \text{ hours } 43 \text{ minutes.}$

Question 13 (2 marks)

Two numbers have a sum of 25 and a difference of 3. Find the two numbers.

Solution: $\text{Large number} : = \frac{25 + 3}{2} = 14,$
 $\text{Small number} : = \frac{25 - 3}{2} = 11.$

Question 14 (2 marks)

How many whole numbers from 10 to 99 inclusive are **not** divisible by 5?

Solution: There is $99 - 9 = 90$ numbers.
 There is 19 numbers divisible by from 1 to 99.
 There is 1 number divisible by 5 from 1 to 9.
 Therefore, there is $90 - (19 - 1) = 72$ numbers not sivable.

Question 15 (2 marks)

Four consecutive odd numbers add up to 56. What are the numbers?

Solution: $N + (N + 2) + (N + 4) + (N + 6) = 56, \Rightarrow 4N + 12 = 56.$
 $4N = 44 \Rightarrow N = 11, \Rightarrow \text{The numbers are: } (11, 13, 15 \& 17).$

Question 16 (2 marks)

What is the maximum number of cards measuring 4 by 3 cm that can be cut from a piece of cardboard measuring 9 by 16 cm?

Solution: $3 \times 4 = 12$ cards.

Question 17 (2 marks)

Find the highest common factor (HCF) of 48 and 84.

Solution: $HCF(48, 84) = 12.$

Question 18 (2 marks)

In a class, there are 22 girls and 16 boys. What is the ratio of the number of girls to the class?

Solution: Number of students in the class: $= 22 + 16 = 38,$
The ratio of the number of girls to the class: $22 : 38 = 11 : 19.$

Question 19 (2 marks)

Find the circumference of a circle if its diameter is 17.5 cm. (using $\pi = 3.14$).

Solution: $C = 2\pi r = 2 \times 3.14 \times \frac{17.5}{2} = 54.95$ cm.

Question 20 (2 marks)

What is the perimeter of an equilateral triangle if one side is $7\frac{3}{4}$ m ?

Solution: $P = 3 \times 7\frac{3}{4} = 3 \times \frac{31}{4} = 23\frac{1}{4}$ cm. or 23.25 cm.

Part C — 10 Extension Questions (3 marks each)

Question 21 (3 marks)

George has 27 coins. Some of them are 5-cent coins and the rest are 20-cent coins. If the total value of the coins is \$4.20, how many of each kind does George have?

Solution: 8 x 5-cent and 19 x 20-cent.

Question 22 (3 marks)

All integers are arranged in 8 columns as shown. In which column will 100 be?

A	B	C	D	E	F	G	H
	1	2	3	4	5	6	7
8	9	10	11	12	13	14	
	15	16	17	18	19	20	21
22	23	24	25	26	27	28	

Solution: Column C.

Question 23 (3 marks)

On a map, a length of 3 centimetres represents an actual distance of 9 kilometres. How many kilometres apart are two towns which are drawn as $5\frac{1}{3}$ centimetres apart on the map?

Solution: $3\text{ cm} : 9\text{ km} = 5\frac{1}{3}\text{ cm} : D\text{ km} \Rightarrow D = 9 \times 5\frac{1}{3} \div 3 = 16\text{ km}.$

Question 24 (3 marks)

A farmer plans to build a rectangular paddock where its length is 3 times its breadth. He has 60 metres of wire and his paddock will be built against an existing fence, so he doesn't need to use his wire on that side. What will be the area of the paddock?

Solution: $L = 3W, 3W + W \times 2 = 60 \Rightarrow W = 12\text{ m} \& L = 36\text{ m} \Rightarrow A = 12 \times 36 = 432\text{ m}^2.$

Question 25 (3 marks)

Tony and David own 91 marbles altogether. For every 2 marbles that Tony collected, David collected 5. How many more marbles does David have than Tony?

Solution: Total units: $2 + 5 = 7$ units, different units: $5 - 2 = 3$ units,
 $91 \div 7 = 13$ marbles/unit, \Rightarrow David will have $3 \times 13 = 39$ marbles more.

Question 26 (3 marks)

If it takes 4 men 28 days to do a piece of work, how long would it take 7 men working at the same rate?

Solution: For one man $4 \times 28 = 112$ days, $\Rightarrow 112 \div 7 = 16$ days.

Question 27 (3 marks)

We won 13 out of every 15 games we played. We lost 6 games. How many games did we play altogether?

Solution: Every 15 games played won 13 and lost 2, therefore, 45 games will lose 6 games.

Question 28 (3 marks)

Horses love to eat grass. The grass in a paddock will last 6 days for 4 horses. How many days should the same amount of grass last 12 horses?

Solution: For one house it will last: $6 \times 4 = 24$ days
For 12 houses it will last: $24 \div 12 = 2$ days.

Question 29 (3 marks)

The normal cost of 8 exercise books is \$10.80. If Keith paid \$51.84 for 4 dozen of these exercise books, how much discount did he receive on his purchase?

Solution: Before discount: $10.8 \div 8 = \$1.35/each$, after discount: $51.84 \div 48 = \$1.08/each$.
Discount recieved: $48 \times (1.35 - 1.08) = \12.96 ; or $\frac{1.35 - 1.08}{1.35} \times 100\% = 20\%$.

Question 30 (3 marks)

Factorial 6 is written as 6!. It means $6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$. Find the value of $\frac{4!+5!+6!}{5!}$.

Solution: $\frac{4! + 5! + 6!}{5!} = \frac{4! + 5 \times 4! + 6 \times 5 \times 4!}{5 \times 4!} = \frac{1 + 5 + 6 \times 5}{5} = 7\frac{1}{5}$.

Part D — 8 Challenging Questions (5 marks each)

Question 31 (5 marks)

Four cannibals are on one side of a river and four missionaries are on the other side. Both groups want to get to the other side. The cannibals have a boat which holds exactly two people. How can the groups get across the river? (Illustrate this by a diagram)

Solution: 5 Groups, $(C_1, C_2), (M_1, M_2), (C_3), (M_3, M_4), (C_4)$.

Question 32 (5 marks)

When roasting chicken John allows 40 minutes per kilogram and 15 minutes extra. If John cooks a chicken for two and three quarter hours, how much did the chicken weigh?

Solution: $2\frac{3}{4} = 120 + 45 = 165$ minutes, $\Rightarrow 165 - 15 = 150$ minutes.
 Chicken weigh: $160 \div 40 = 3.75$ kg.

Question 33 (5 marks)

A rectangular tank measuring 5m by 4.5m by 3m contains water to a height of 1m. How much more water is needed to fill up $\frac{2}{3}$ of the tank?

Solution: The high of the water tank is 3 metres, it contains 1 metre water,
 It will need to fill another one metre to be up to $\frac{2}{3}$ of the tank.
 Therefore $5 \times 4.5 \times 1 = 22.5m^3 = 22,500$ L.

Question 34 (5 marks)

$\frac{2}{3}$ was subtracted from a certain number, then multiplied by $1\frac{1}{2}$ and $\frac{1}{4}$ was subtracted. The result was then multiplied by $3\frac{1}{5}$ giving the answer 20. What was the number?

Solution: $[(N - \frac{2}{3}) \times 1\frac{1}{2} - \frac{1}{4}] \times 3\frac{1}{5} = 20.$
 $[(N - \frac{2}{3}) \times 1\frac{1}{2} - \frac{1}{4}] = 20 \times \frac{5}{16}$
 $(N - \frac{2}{3}) \times \frac{3}{2} - \frac{1}{4} = \frac{25}{4}$
 $N - \frac{2}{3} = \frac{26}{6}$
 $N = \frac{26}{6} + \frac{2}{3} = 5.$

Question 35 (5 marks)

Daniel is chasing his brother Joe. For every 7 metres that Daniel runs, Joe runs 5 metres. If they are 10 metres apart, how far must Daniel run in order to reach Joe?

Solution: $5 \text{ lots } 2 \text{ m is } 10 \text{ m} \Rightarrow 5 \times 7 = 35\text{m.}$
 $\therefore \text{ Daniel must run } 35 \text{ m.}$

Question 36 (5 marks)

There are 4 blue, 5 purple, 4 gray, 2 violet and 5 brown marbles in a hat. You pick 2 marbles from the hat one by one. Marbles are not returned after they have been drawn. Find the probability that the first marble is blue and the second marble is also blue.

Solution: $\text{Total number of marbles: } 4 + 5 + 4 + 2 + 5 = 20,$
 $\text{First pick of blue: } \frac{4}{20} = \frac{1}{5}, \text{ second pick of blue: } \frac{3}{19},$
 $\text{The chance of both are blue: } = \frac{1}{5} \times \frac{3}{19} = \frac{3}{95}.$

Question 37 (5 marks)

The value of 14! is the product of all the whole numbers from 1 to 14 inclusive. Find the maximum number of times that 2 will divide into 14! exactly.

Solution: $14! = (2 \times 7) \times 13 \times (2 \times 2 \times 3) \times 11 \times (2 \times 5) \times 9$
 $\times (2 \times 2 \times 2) \times 7 \times (2 \times 3) \times 5 \times (2 \times 2) \times 3 \times 2 \times 1.$
 $\text{Therefore, } 2 \text{ occurs } 11 \text{ times.}$

Question 38 (5 marks)

An ancient civilization had a way of expressing their fractions where the numerators were always one. For example: $\frac{7}{10} = \frac{1}{2} + \frac{1}{5}$. Find the value of A, B and C if $\frac{11}{12} = \frac{1}{A} + \frac{1}{B} + \frac{1}{C}$.

Solution: $A = 2, B = 4, C = 6, \text{ or } A = 2, B = 3, C = 12.$
 $e.g. \frac{1}{2} + \frac{1}{4} + \frac{1}{6} = \frac{6}{12} + \frac{3}{12} + \frac{2}{12} = \frac{11}{12}.$
 $\frac{1}{2} + \frac{1}{3} + \frac{1}{12} = \frac{6}{12} + \frac{4}{12} + \frac{1}{12} = \frac{11}{12}.$