

Year 7 Term 2 Homework

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

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5 Year 7 Term 2 Week 5 Homework

5.1 Number Patterns and Pronumerals

5.1.1 Algebraic conventions

Exercise 5.1.1 Write each of these products without any multiplication signs.

1. $7 \times (3 + x) \times y$ _____

2. $(x + 3) \times (y + 4)$ _____

3. $(p - 2) \times (q + 4)$ _____

4. $(2a + 3b) \times (4c + 5d)$ _____

5. $(3 \times 5) \times (2a + 5b) \times 4$ _____

Exercise 5.1.2 Write each expression as a fraction.

1. $(x - 3y) \div 4$ _____

2. $12 \div (2a + 3b)$ _____

3. $(x - 2) \div (y + 4)$ _____

4. $(2a + 3b) \div (3a + 4b - c)$ _____

5. $2 \times (2x - 4) \div (2 - 5y)$ _____

Exercise 5.1.3 Write each of these expressions without any multiplication or division signs.

1. $8 \times (3 \times p + q \times 5) - 6 \times r$ _____

2. $(2 \times x + 4 \times y) + 3 \times (3 \times y + 5 \times z) + 7 \times y + 1$ _____

3. $a \times (2 \div y + 1 \div z) \times y$ _____

4. $[(3 + 5 \times a) - b] \div [2 \times a \times (6 \times c - 1)]$ _____

5. $(5 \times a - 2 \times b + c \times d) \times (t \times 3 - u \times v \times w) \div (a - 2 \times b \times c + 1)$ _____

5.1.2 Number patterns**Exercise 5.1.4 Find the next two numbers in each pattern.**

1. 6, 18, 8, 24, 14, 42, 32, _____ , _____

2. 8, 6, 12, 10, 20, 18, 36, _____ , _____

3. 3, 6, 9, 18, 21, 42, 45, _____ , _____

4. 52, 60, 57, 66, 63, 73, 70, _____ , _____

5. 74, 71, 68, 64, 61, 56, 53, _____ , _____

Exercise 5.1.5 Write down the next three numbers in each of the following patterns. What kind of numbers are shown in each case?

1. 1, 4, 9, 16, 25, 36, _____ , _____ , _____

2. 1, 1, 2, 3, 5, 8, 13, _____ , _____ , _____

3. 1, 3, 6, 10, 15, 21, _____ , _____ , _____

4. 2, 3, 5, 7, 11, 13, 17, _____ , _____ , _____

5. 1, 3, 5, 7, 9, 11, _____ , _____ , _____

Exercise 5.1.6 Complete the next three lines of each of these patterns:

1. $(1 \times 3) + 1 = 4 = 2^2$
 $(2 \times 4) + 1 = 9 = 3^2$
 $(3 \times 5) + 1 = 16 = 4^2$

2. $8 \times 1 + 1 = 9 = 3^2$
 $8 \times (1 + 2) + 1 = 25 = 5^2$
 $8 \times (1 + 2 + 3) + 1 = 49 = 7^2$

3. $5^2 - 0^2 = 5 \times 5 = 25$
 $6^2 - 1^2 = 7 \times 5 = 35$
 $7^2 - 2^2 = 9 \times 5 = 45$

Exercise 5.1.7 Find a rule that relates the terms (T_n) in each pattern to their position number n , then find the 50th number in each pattern.

1. 9, 10, 11, 12, . . .

2. 2, 5, 8, 11, . . .

3. 7, 17, 27, 37, . . .

5.1.3 Describing the relationship between two quantities

Exercise 5.1.8



1. How many matches need to be added to extend each figure?

2. Complete the following table.

<i>Step of matches</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Number of matches</i>	5	8		
	$2 + 3$	$2 + 3 + 3$		
	$2 + (1 \times 3)$	$2 + (2 \times 3)$		

3. Find the rule which can be used to find the number of matches in each step.

4. How many matches would be needed to make the figure in step 50?

5. Write down a different rule that could be used to find the number of matches in each step.

5.1.4 Table of values

Example 5.1.1 Complete this table of values using the given rule: $y = 2x + 5$

Solution :

x	1	2	3	4	5
y	7	9	11	13	15

Exercise 5.1.9 Complete each of the following tables using the given expression.

1. using the rule: $y = 3 \times x + 2$

x	1	2	3	4	5
y					

2. using the rule: $y = \frac{1}{2} \times x + 2$

x	8	10	12	14	16
y					

3. using the rule: $b = 4a - 2$

a	4	5	6	7	8
b					

4. using the rule: $b = 2 \times (a + 1)$

a	4	5	6	7	8
b					

5. using the rule: $q = (p + 3) \times 6$

p	0	1	2	3	4
q					

Exercise 5.1.10 Find a rule that could be used to generate each table of these values.

1.

<i>a</i>	1	2	3	4	5
<i>b</i>	6	11	16	21	26

2.

<i>x</i>	1	2	3	4	5
<i>y</i>	6	7	8	9	10

3.

<i>a</i>	12	13	14	15	16
<i>b</i>	8	7	6	5	4

4.

<i>a</i>	10	11	12	13	14
<i>b</i>	3	4	5	6	7

5.

<i>a</i>	1	2	3	4	5
<i>b</i>	5	7	9	11	13

5.1.5 Problem solving

Exercise 5.1.11 Ratio

1. A rectangle has a perimeter of 240 cm. The ratio of its length to its breadth is 3 : 5. Find its area.

2. A rectangle has a perimeter of 450 m. The ratio of its length to its breadth is 5 : 4. Find its area.

3. The ratio of the area of a square to that of a rectangle with a perimeter of 200 cm is 1 : 24. The ratio of the length of the rectangle to its breadth is 3 : 2. Find the perimeter of the square.

4. The ratio of the perimeter of a rectangle to that of a square with an area of 144 cm^2 is 5 : 1. The ratio of the breadth to the length of the rectangle is 3 : 5. Find the difference in area between the square and the rectangle.

5.2 Maths Challenge

Exercise 5.2.1

1. Four of these operations are equal. Which is the odd one out?

- (A) $1 \div 9 + 9 \div 1$ (B) $1 \times 9 \div (9 \times 1)$ (C) $1 - 9 + 9 \times 1$
 (D) $1 + 9 \div 9 - 1$ (E) $1 \times (9 - 9) + 1$

2. Four of the following are equal. Which is the odd one out?

- (A) $\frac{1}{3} + \frac{5}{7}$ (B) 0.6 (C) $\frac{15}{25}$ (D) $\frac{1}{10} + \frac{1}{2}$ (E) 60%

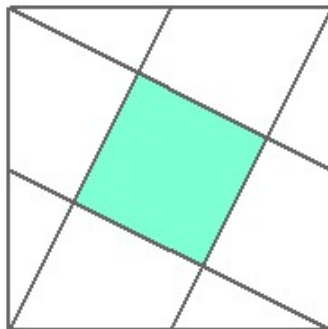
3. How many of these statements are true?

- (I) $12 \div \frac{1}{4} = 3$, (II) $0.3 = 3\%$, (III) $\frac{1}{9} > \frac{1}{7}$, (IV) $0.2 \times 0.4 = 0.8$
 (A) 1 (B) 2 (C) 3 (D) 4 (E) none

4. You have to use the digits 8, 6, 4, 0, 7, 2 once to make the smallest possible even six-digit number. Which digit should you put in the hundreds place?

- (A) 2 (B) 4 (C) 6 (D) 7 (E) 9

5. The square has sides of 20 cm. The corners and midpoints of the sides are jointed as shown. What is the area of the central quadrilateral?



5.3 Miscellaneous Exercises

Exercise 5.3.1

1. The petrol tank of a car with capacity of 64 litres is $\frac{3}{4}$ filled. If $\frac{1}{3}$ of this fuel is used up during a trip, how much petrol is needed to completely fill the tank?

2. Find the odd one out in each group of numbers and explain why you made the choice.

(a) 7, 17, 27, 37, 47, 67 and 97. _____

(b) 126, 456, 315, 453 and 415. _____

(c) (1, 9), (3, 7), (4, 6), (2, 5), (9, 1), (8, 2) and (5, 5). _____

3. Find the missing numbers of each:

(a)

4	5	2	8	7	10	9	11
22	27	12	42				

(b)

8	4	7	6	11	5	9	1
20	12	18	16				

(c)

3	9	5	6	2	10	12	8
6	72	20	30				

4. To encourage Emma to improve her spelling, her father said he would give her 12 cents for every word she spelled correctly in her weekly spelling test and reduce 7 cents for every misspelling word. There are 25 words in the test last week. If Emma's father had to pay \$1.48, how many words did she spelled correctly?

Exercise 5.3.2

1. Jane ate a total of 100 jellybeans in 5 days, each day eating 6 more than on the pervious day. How many jellybeans did she eat on the fourth day?

2. I am less than 50 years old. Two years ago my age was a multiple of 6. Last year it was a multiple of 5. How old am I now?

3. Amy, Bob and Charles each take two Vitamin C tablets daily, while David takes only one tablet daily. One bottle has enough tablets to last these four people exactly eight weeks. How many days will the same bottle of tables last if David takes two tablets daily instead of one tablet?

4. The area of a rectangle is 72 cm^2 . The lengths of the sides are whole numbers. What is the largest perimeter the rectangle can have?

5. The interior of a circle can be cut into a maximum of 2 regions by one straight line. The interior can be cut into a maximum of 4 regions by 2 straight lines. What is the maximum number of regions into which the interior can be cut by 5 straight lines?

Exercise 5.3.3

1. Find the value of $6a^2 - 9b^2 + 5c$, when $a = 3$, $b = 4$ and $c = 5$.

2. Anna had a piece of ribbon x m long, she used $\frac{4}{9}$ of it to tie a present. How much ribbon had she left?

3. Adam is 15 years old. His father is x years older than he. What will be their total ages in $3x$ years' time?

4. A motorist travels $36p$ km in 3 hours. Travelling at this rate, how long will he take to complete a journey of $56p$ km?

5. A chicken has a mass of $3p$ kg. A puppy is 4 kg heavier than the chicken. The mass of a dog is twice the total mass of the puppy and chicken.

(a) Find the total mass of the three animals in terms of p .

(b) If $p = 2$, find the average mass of the three animals.
