Year 6 Term 1 Week 4 Homework

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

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4 Year 6 Term 1 Week 4 Homework

4.1 Topic 1— Number Patterns

Example 4.1.1 Unusual Patterns

What could be the next two numbers in the following pattern? 3, 6, 9, 21, 51, 81, ___ , ___ , . . .
Hint: a normal pattern will look like this: 3, 6, 9, 12, 15, 18, 21, 24, . . . Compare this pattern with the first pattern you will notice that each number is a simple reversal of their digit or digits.
***Answer**: so the next two numbers should be 12 and 42.*

Exercise 4.1.1

1. *Find the missing number for the sequences below:*

   (a) *0.1 , 0.4 , 1.6 , 6.4 , _____ , . . .*

   (b) *0.2 , 0.04 , 0.008 , 0.0016 , _____ , . . .*

   (c) *1 , _____ , $\frac{1}{9}$, $\frac{1}{27}$, . . .*

   (d) $\frac{1}{5}$, _____ , $\frac{4}{5}$, $1\frac{3}{5}$, . . .

   (e) *90% , _____ , 22.5% , 11.25% , 5.625% , . . .*

2. *What would be the next two numbers in each of the following patterns?*

   (a) *1 , 4 , 9 , 61 , 52 , 63 , _____ , _____ , . . .*

   (b) *0 , 4 , 8 , 21 , 52 , 65 , _____ , _____ , . . .*

   (c) *15 , 26 , 40 , 16 , 37 , 58 , _____ , _____ , . . .*

   (d) *5 , 2 , 6 , 3 , 9 , 6 , _____ , _____ , . . .*

   (e) *7 , 12 , 22 , 42 , 82 , _____ , _____ , . . .*

3. *What would be the most likely missing number in the following patterns?*

   (a) *9 , 10 , 8 , 11 , 7 , _____ , 6 , . . .*

   (b) *3 , 10 , 31 , 94 , _____ , 850 , . . .*

   (c) *16.8 , 15.57 , 14.34 , _____ , . . .*

   (d) *50 , 20 , 8 , _____ , . . .*

   (e) *1 , 3 , 9 , 27 , _____ , 243 , . . .*

4.2 Topic 2 — Ratio and Rate

Exercise 4.2.1

1. *Two students start walking at the same time. Student A is walking down a 4km long slope at 6km/h. Student B is walking up a 4 km long slope at 4km/h. How far has student B walked when student A has reached the bottom of the slope?*

2. *On a map, 2cm represents a distance of 15 km.*

   (a) *How many kilometres would be represented by a map length of 5.75 cm?*

   (b) *What distance on the map would correspond to a distance between two towns which are 120 km apart?*

3. *Gary and Mary ran a race. They had to run to the marker and return back to the starting point.*

   (a) *If Gary ran to the end of the course, turned around and was halfway back to the starting point when he met Mary, how many times faster had Gary been running than Many?*

   (b) *If Gary ran to the end of the course, turned around and was two thirds back to the starting point when he met Mary, how many times faster had Gary been running than Many?*

4. *Kevin and Raymond start to run from two diametrically opposite points A and B on a circular track, each with different but uniform speed and in opposite directions. They meet after $2\frac{1}{2}$ minutes and each continue to run on his course round the track. How many minutes later will they meet again?*

4.3 Topic 3 — Fractions (Unit Fraction)

Summary:

- A unit fraction is a fraction with a numerator of 1 and a denominator that can be any counting number.
- The denominator of the first unit fraction is equal to one-half of the sum of the denominator of the given fraction and 1.
- The denominator of the second unit fraction is the product of the denominator of the given fraction and the denominator of the first unit fraction.
- Every unit fraction can be written as the sum of two equal unit fractions like this: $\frac{1}{2} = \frac{1}{4} + \frac{1}{4}$.

Example 4.3.1 Change the following fractions into the sum of distinct unit fractions:

- $\frac{2}{5} = \frac{1}{3} + \frac{1}{15}$ *[Note:* $3 = (5+1) \div 2$ *and* $3 \times 5 = 15$ *]*
- $\frac{2}{7} = \frac{1}{4} + \frac{1}{28}$ *[Note:* $4 = (7+1) \div 2$ *and* $7 \times 4 = 28$ *]*
- $\frac{2}{11} = \frac{1}{6} + \frac{1}{66}$ *[Note:* $6 = (11+1) \div 2$ *and* $6 \times 11 = 66$ *]*

Exercise 4.3.1 Write the following fractions as the sum of two distinct unit fractions:

1. $\frac{2}{3} =$ _____
2. $\frac{2}{13} =$ _____
3. $\frac{2}{15} =$ _____
4. $\frac{2}{25} =$ _____
5. $\frac{2}{9} =$ _____
6. $\frac{2}{19} =$ _____

4.4 Topic 4 — Factors and Primes

Exercise 4.4.1

1. *How many numbers between 5 and 50 are divisible by 3?*

2. *The same number is multiplied to both $\frac{3}{16}$ and $\frac{5}{24}$. For the fractions to become whole numbers, find the least number.*

3. *How many 2 digit numbers leave a remainder of 1 when divided by 7?*

4. *Find the HCF of 198 and 306.*

5. *Find the LCM of 22, 24 and 40.*

6. *Find the sum of all the prime numbers from 10 to 50.*

7. *A rectangular paddock has an area of 216 m^2. Find the length if it is 6 m longer than the breadth.*

8. *70 tiles each measure 30 cm by 20 cm. What is the area of the largest square possible using these tiles?*

4.5 Problem Solving (Divisibility by 11)

Summary: If a number is divisible by 11 the difference between the sum of the odd-place digits and the sum of even-place digits are divisible by 11.

Example 4.5.1 Use the divisibility test to determine if each number is divisible by 11

- *27863 is divisible by 11, because (2 + 8 + 3) - (7 + 6) = 0*
- *180939 is divisible by 11, because (8 + 9 + 9) -(1 + 0 + 3) = 22*
- *4619142 is divisible by 11, because (6 + 9 + 4) - (4 + 1 + 1 + 2) = 11*

Exercise 4.5.1

1. *Use the divisibility test to determine if each number is divisible by 11.*

   (a) 1826 _____ *Y or N*

   (b) 82808 _____ *Y or N*

   (c) 1726923 _____ *Y or N*

   (d) 9257 _____ *Y or N*

   (e) 54321 _____ *Y or N*

2. *Replace A, so that the resulting number is divisible by 11.*

   (a) A 3 9 *A* = _____

   (b) 3 9 A 7 *A* = _____

   (c) 8 0 A 1 9 *A* = _____

   (d) 3 9 A 2 1 *A* = _____

   (e) 2 A 8 7 *A* = _____

3. *Replace the missing digits in ? 5 ? so that the resulting number is divisible by 11. How many different answers can you find?*

   _____

   _____

   _____

4.6 Test Paper 4

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

1. Which one of the following has the smallest answer? [1]
   (a) $10 \times \frac{1}{5}$ (b) $10 \div \frac{1}{4}$ (c) $\frac{1}{2} \div \frac{1}{5}$ (d) $\frac{1}{5} \div \frac{1}{2}$

2. 24 _____ 6 _____ 3 = 7, the missing signs are: [1]
   (a) + and $\div$ (b) $\div$ and + (c) - and $\div$ (d) $\div$ and -

3. How many hundredths are there in 0.9? [1]
   (a) 90 (b) 9 (c) 900 (d) 0

4. When you add two numbers, you get 15 and when you find their difference you get 3. What would you get if you multiplied the numbers? [1]
   (a) 44 (b) 54 (c) 64 (d) 36

5. Which fraction below is closest to $\frac{1}{2}$? [1]
   (a) $\frac{4}{11}$ (b) $\frac{8}{13}$ (c) $\frac{49}{100}$ (d) $\frac{5}{15}$

6. Tony takes 6 minutes and 15 seconds to walk to school. He can run 3 times faster than he can walk. How long will it Tony take if he runs to school? [1]
   (a) 2.5 min (b) 2 min 5 sec (c) 18.45 min (d) 18 min 45 sec

7. Which of these fractions is equal to $\frac{3}{4}$? [1]
   (a) $\frac{3-1}{4-1}$ (b) $\frac{3\times3}{4\times4}$ (c) $\frac{3+2}{4+2}$ (d) $\frac{3\times2}{4\times2}$

8. 0.2×120 is the same as: [1]
   (a) 0.4×240 (b) 10×240 (c) $240 \div 10$ (d) 240×10

9. Which one of the following statements is false? [1]
   (a) $\frac{1}{4} \div 4 = 1$ (b) $\frac{1}{4} > \frac{1}{5}$ (c) $\frac{2}{3} + \frac{1}{3} = 1$ (d) $5 \div \frac{1}{5} = 25$

10. At the school concert $\frac{5}{8}$ of the audience were parents and visitors, $\frac{1}{4}$ were students and rest were teachers. If there were 16 teachers, how many people were at the school concert? [1]
    (a) 108 (b) 128 (c) 144 (d) 120

4.6.2 Part B — 10 Average Questions (2 marks each)

11. A motorist made a 60 km trip averaging 20 km/h. On the return trip, he averaged 30km/h. What was the motorist's average speed for the entire trip? [2]

12. The four digit number "7AA1" is divisible by 9. What does the digit A represent? [2]

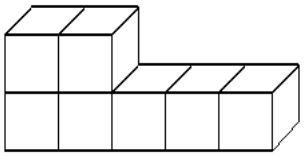
13. Dolly arrived 9 minutes late for the 10:45 train. How long does she have to wait for the next train which is due at 11:27? [2]

14. Crystal practices on her piano for $\frac{5}{12}$ hours each day. How many minutes does she practice on the piano in one week? [2]

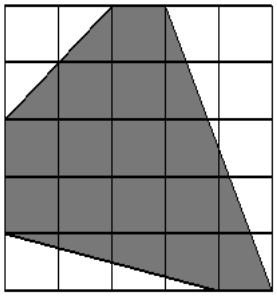
15. A box contains 6 red marbles, 4 white marbles, 3 green marbles, 5 yellow marbles and 7 blue marbles. What fraction of the marbles are yellow? [2]

16. Mary saved \$75 at the 25%-off-sale. How much must she have spent? [2]

17. A solid block is made up of red cubes. It is then painted black on the outside and base. When the paint is completely dry, the pieces are taken apart. How many pieces have black paint on 4 faces only? [2]



18. Each small square represents 1 cm^2. How many square centimetres is the shaded area? [2]



19. The surface area of the a cube is 216 cm^2. Find the sum of the lengths of its edges. [2]

20. The number most likely needed to complete the series 2, 3, 5, 9, 17, . . . is: [2]

4.6.3 Part C — 10 Extension Questions (3 marks each)

21. If one square has three times the perimeter of another, how much larger is its area? [3]

22. Amy spent $\frac{1}{3}$ of her money on cosmetics and $\frac{1}{2}$ of the remainder on clothes during a shopping trip. She also bought a pair of shoes for \$89 and discovered that she had \$25 left. How much money did she have before the shopping trip? [3]

23. Michael mixed 4 bottles of cordial with 6 jugs of water to make a cordial drink. If each bottle of cordial contains $\frac{5}{8}$ litres and each jug contains $\frac{3}{4}$ litres of water, how much cordial drink has he made? [3]

24. After Alex has given \$15 to John, they have equal sums of money. What is the difference between their original sums of money? [3]

25. Steven had 90 apples and he shared some apples equally with 2 friends. For the remaining apples, he packed 8 apples into a box. He used up 9 boxes and found that he had 6 apples left. How many apples did each his friends receive? [3]

26. In a group of 29 students, 8 study French only, 12 study Chinese and 2 study both languages. How many students study neither language? [3]

27. A car covers a distance of 60 km. The circumference of one of its tyres is 1.25 m. How many revolutions will the tyre make while travelling this distance? [3]

28. Student A wrote down the largest 4-digit number which contains the digits 4 and 8. Student B wrote down the smallest 4-digit number which contains the digits 2 and 7. Find the difference of these two numbers. [3]

29. David drives for 80 km at an average speed of 60 km/h and then he drives for 30 km at 45 km/h. What was David's average speed for the entire trip? [3]

30. A student draws a rectangle with a perimeter of 26 cm and with sides whose lengths are whole numbers. What would be the greatest possible area that this rectangle could have? [3]

4.6.4 Part D — 8 Challenging Questions (5 marks each)

31. James reared 0.7 times as many fish as Raymond. Adam has three times as many fish as James. If James had 63 fish. How many more fish than Raymond does Adam have? [5]

32. Sandy earns $1820 every month. She saves part of it and spends the rest. How much will she spend in 2 years if her expenditure is $\frac{1}{5}$ more than her savings? [5]

33. The ratio of Kevin's number of toy cars to Daniel's is 9:4. The ratio of Daniel's number of toy cars to Ray's is 6:5. If Kevin has 81 toy cars, how many toy cars does Ray have? [5]

34. Tom and Bob shared a sum of money. Tom received 60% of the money. If Bob received $28 less than Tom, how much did Bob receive? [5]

35. "You can have the painting framed," said the artist, "for $520, or in another frame only half the value for $480." How much was the painting unframed? [5]

36. Mary scored 85 marks for her first Maths test and $\frac{4}{5}$ of that score in her second test. In her third test, she scored 10 marks more than her second test. Find her average score of the 3 tests. [5]

37. Joe went to a furniture store and bought a desk, a chair and a chest of drawers. He spent $200 altogether. The desk cost $40 more than the chest of drawers, and the chair cost $30 more than the desk. How much did the chair cost? [5]

38. Adam, Bob and Carlo were candidates for school captain. Adam received 132 more votes than Carlo. Bob received 68 more votes than Carlo. Together Adam and Bob scored 368 votes. How many votes did Adam and Carlo receive together? [5]