

Year 6 Term 1 Week 3 Homework

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

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3 Year 6 Term 1 Week 3 Homework

3.1 Topic 1 — Factors, Multiples and Primes

1. Multiples:

- Common Multiples: common multiples of 3 and 4 are 12, 24, 36, 48, . . .
- Lowest Common Multiples (LCM): the lowest common multiples of 3 and 4 is 12.
- Lowest Common Multiples of more than two numbers: such as LCM(4, 6, 9)
The LCM algorithm (each number is divided by the prime fractions until all the quotients are primes).

3	4, 6, 9
2	4, 2, 3
2	1 3

Then the LCM is the product of all primes, ($3 \times 2 \times 2 \times 1 \times 3 = 36$)

2. Factors: Any whole number that divides exactly into another number is called a factor of that number. $6 = 2 \times 3$ and $6 = 6 \times 1$, so the factors of 6 are 1, 2, 3, and 6.

- Common Factors: When two or more numbers have the same factor, that factor is called a common factor.
- Highest Common Factors (HCF): The largest number that divides evenly into two or more numbers is known as the highest common factor.

3. Primes and Composites:

- Prime: A prime number has only two factors, one and itself.
- Composite: A composite number is any whole number that is not prime.

Exercise 3.1.1

1. Find the sum of the prime numbers less than 20. _____

2. Find the LCM and HCF of 12 and 32. _____

3. Find the LCM and HCF of 36 and 48. _____

4. Find the LCM and HCF of 150 and 240. _____

3.2 Topic 2 — Number Patterns

1. **Odd and Even Numbers:** (1, 3, 5, 7 ...) ; (2, 4, 6, 8, 10, ...)
2. **Figurate Numbers:**
 - (a) **Square Numbers:** 1, 4, 9, 16, 25, 36, . . . n^2
 - (b) **Triangular Numbers:** 1, 3, 6, 10, 15, 21, . . . (Note: $3 = 1 + 2$, $6 = 1 + 2 + 3$, $10 = 1 + 2 + 3 + 4$)
3. **Palindromic Numbers:** 1991, 12321, 24642.
4. **Fibonacci Numbers:** 1, 1, 2, 3, 5, 8, 13, 21, 34, . . . (Note: $1 + 1 = 2$, $1 + 2 = 3$, $2 + 3 = 5$, $3 + 5 = 8$)

Exercise 3.2.1

1. If the first day of a certain month is a Monday, What day of the week is the 28th day of that same month? _____
2. If the first day of a certain year is a Sunday, what day of the week is 21st February of the same year? _____
3. What is the next number of the sequence? 103 , 131 , 159 , 187 , _____
4. What is the first missing number of the following sequence?
155 , _____ , 143 , _____ , _____ , 125 , _____ , 113 , . . .
5. What is the fourth number in the sequence?
109 , _____ , 117 , _____ , 125 , _____ , _____ , _____ , 141 , . . .
6. What are the next two numbers of the sequence? 1, 4, 9, 16, _____ , _____ . . .
7. What are the next two numbers of the sequence? 64, 32, 36, 18, 22, 11, _____ , _____ . . .
8. Find the next two numbers of the sequence: 1 , 3 , 6 , 10 , _____ , _____ . . .
9. Find the next two numbers of the sequence: $\frac{1}{3}$, $\frac{2}{4}$, $\frac{3}{5}$, $\frac{4}{6}$, _____ , _____ . . .
10. What are the next two numbers of the sequence? 1 , 6 , 15 , 28 , 45 , _____ , _____ . . .

3.3 Topic 3 — Ratio and Rate**Exercise 3.3.1**

1. The ratio of the number of English books to the number of Chinese books in a class library was 8:5. After 210 English books were borrowed, the ratio of the number of English books to the number of Chinese books became 9 : 10. How many English books were in the library at first?

2. The ratio of girls and boys in a hall is 7:5. If there are 455 girls in the hall, how many more girls are there than boys?

3. Henry and Gary have 2430 stamps altogether. If Henry has 25% more stamps than Gary, find the number of stamps Gary has.

4. Leo has twice as much money as Nail. Max has \$18 more than Leo. If they have total of \$188, how much do Nail and Max have altogether?

3.4 Topic 4 — Fractions

- **Equivalent Fractions:** Formed by multiplying the numerator and the denominator by the same number.
- **Comparing Fractions:** Compare the numerators when they have the same denominators.
- **Improper Fractions:** numerator > denominator
- **Mixed Numerals:** Whole number plus fraction.
- **Reciprocals:** Flip the fraction upside down.

Exercise 3.4.1

1. Evaluate the following fractions:

(a) $2\frac{1}{10} + 3\frac{1}{4} =$ _____

(b) $1\frac{1}{5} + 2\frac{1}{3} + 3\frac{3}{4} =$ _____

(c) $3\frac{1}{2} - 2\frac{1}{3} =$ _____

(d) $7\frac{1}{4} - 4\frac{7}{10} =$ _____

(e) $\frac{5}{6} \times 1\frac{2}{5} =$ _____

(f) $8 \times 6\frac{1}{4} =$ _____

(g) $(2\frac{1}{3})^2 =$ _____

(h) $\frac{3}{4} \div 1\frac{1}{2} =$ _____

2. In each hour of television there is twelve minutes of advertising.

(a) What fraction of each hour is devoted to advertising? _____

(b) If each advertising break takes three minutes, how many advertising breaks occur in each twenty four hour period? _____

3. In a class, half of the twenty four students are girls. If three quarters of the girls have brown hair, how many brown haired girls are there in the class? _____

3.5 Problem Solving (Factors and Primes)

- If p is a prime number, then p^n has $n+1$ factors including 1 and p^n itself.
- If $N = p^a \times q^b \times r^c \times \dots$, then N has $(a+1) \times (b+1) \times (c+1) \times \dots$ different factors.
where p, q, r, \dots are different prime and a, b, c, \dots are exponents.

Example 3.5.1 How many factors does 432 have?

$$432 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^4 \times 3^3$$

Since $(4+1) \times (3+1) = 20$, 432 has a total of 20 factors.

1. How many factors does 720 have?

2. How many factors does 875 have?

3. Which has more factors, 96 or 72?

4. How many numbers are there less than 30 which have exactly 6 factors?

5. Find the number of terminal zeros in the following numbers:

- (a) $7!$ _____
(b) $10!$ _____
(c) $18!$ _____
(d) $25!$ _____

3.6 Test Paper 3**Part A — 10 Multiple Choice Questions (1 mark each)**

1. How many hundredths are there in 3.3? [1]
(a) 3 (b) 30 (c) 33 (d) 330

2. How many pieces of ribbon with a length of 35 cm can be cut from a roll $4\frac{1}{5}$ metres long? [1]
(a) 9 (b) 12 (c) 16 (d) 18

3. In a choir there are twice as many girls as boys. If there are 36 students in the choir, how many are girls? [1]
(a) 12 (b) 16 (c) 24 (d) 18

4. Mike went to the zoo. He stayed there for $6\frac{1}{4}$ hours, and left at five past four in the afternoon. What time did he arrive at the zoo? [1]
(a) 8.50 a.m. (b) 8.45 a.m. (c) 9.25 a.m. (d) 9.50 a.m.

5. if $\star \div 8 = 72 \div 6$, then $\star =$ [1]
(a) 12 (b) 96 (c) 48 (d) 64

6. Which number in the list: 2, 4, 6, 8, 10, 12, 14, should be removed so that the average of the remaining numbers is 9? [1]
(a) 2 (b) 4 (c) 12 (d) 14

7. The ratio of 6 m : 1 m 50 cm is [1]
(a) 5 : 16 (b) 1 : 3 (c) 4 : 1 (d) 600 : 105

8. Evaluate $365 + 450 \div 9 \times (225 + 60 - 99)$. [1]
(a) 3665 (b) 9665 (c) 22685 (d) 10665

9. The average of 4 numbers is 15. If the average of three of them is 18, what is the fourth number? [1]
(a) 5 (b) 6 (c) 7 (d) 8

10. Find the value of 2.345×18 . [1]
(a) 42.12 (b) 42.21 (c) 52.12 (d) 54.21

Part B — 10 Average Questions (2 marks each)

11. Joe wanted to multiply a number by 23, but divided by 23 instead. His answer was 32. What should his answer have been? [2]

12. Lisa wanted to subtract 28, but added 28 by mistake. Her answer was 117. What should her answer have been? [2]

13. A book has 300 pages. These 300 pages are 2 centimetres thick altogether. If all the pages have the same thickness, what is the thickness of six pages? [2]

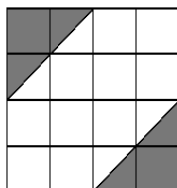
14. A square has a perimeter of 68 cm. Find the area of the square. [2]

15. How many 2-cm cubes can be put together to form a cuboid measuring 8 cm by 8cm by 6 cm? [2]

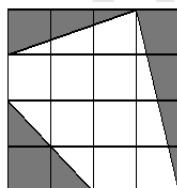
16. Linda has m bookmarks, Susan has 3 times more than Linda. Amy has twice of Susan. How many bookmarks do they have altogether in terms of m in its simplest form? [2]

17. In a supermarket, oranges are sold at \$A for 3. Mangoes are sold in boxes of 15, each box costing \$B. How much do 15 oranges and 60 mangoes cost in terms of A and B.

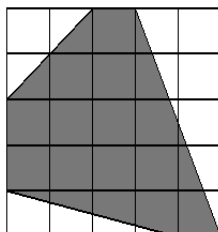
18. What fraction of the square below is shaded? [2]



19. What fraction of the square below is shaded? [2]



20. What fraction of the square below is **NOT** shaded? [2]



Part C — 10 Extension Questions (3 marks each)

21. A water tank filled with water weighs 16 kg. When it is half full the tank and water together weigh 11 kg. How much does the empty tank weigh? [3]

22. A jug weighs 250 g. When the jug is one quarter full of water, the jug and the water together weigh 400 g. What do the jug and water together weigh if the jug is half full? [3]

23. Potatoes are sold in two different packages: 500 g bag for \$1.80 and 2 kg bag for \$6.50. Dolly wants to buy 6 kg of potatoes. How much will she save by buying the potatoes in 2 kg bags rather than 500 g bags? [3]

24. An equilateral triangle has an area of 30 square centimetres. A large triangle is made by increasing each side by a factor of three. Find the area of the large triangle. [3]

25. A square has an area of 540 cm^2 . A small square is cut from the large square. The small square has all the sides that are just one third of the large square. What is the area of the small square? [3]

26. Cathy has a tablecloth that fits on a round table which has a diameter of 1.5 metres with 25 centimetres hanging over the edge. She wants to put a lace border tight around the edge of the tablecloth. What is the length of the lace she needs? [3]

27. Jessica was given a box of chocolates that weighed 380 grams as a birthday present. She shared half of the chocolates with her friends. The remaining half box weighed 220 grams. She then ate the rest of the chocolates. What does the empty box weigh? [3]

28. Alice has a tablecloth that fits on the a rectangular table which is 1.2 m by 1.6 m. The cloth covers the table completely with 20 cm hanging over each edge. Alice wants to put two lace borders on it, one is right around the edge and another is 5 cm apart from the edge. What is the total length of the lace she needs? [3]

29. The ratio of the perimeter of a rectangle to that of a square is 7 to 3. If one side of the square is 12 cm, find the difference in their perimeters. [3]

30. $\frac{1}{4}$ of beans in a bag were red, $\frac{1}{8}$ of them were blue while the rest were yellow. Find the total number of beans in the bag if there were 32 more yellow beans than blue ones. [3]

Part D — 8 Challenging Questions (5 marks each)

31. Yesterday, Ray and Bob each have an average of 88 marbles. Each of them bought 44 more marbles [5]
today. Now Ray has 20% more marbles than Bob. Find the ratio of Ray's marbles to Bob's marbles
yesterday.

32. William and his little brother are having a race over 500 metres and William gives his brother a
30-second start. William runs at 15 seconds per 100 metres and his brother runs at 20 seconds per
100 metres.

- (a) How far apart will they be after the first minute? [1]

- (b) When does William catch his brother? [2]

- (c) How many metres will they have run when William catches his brother? [2]

33. Linda paid \$107.70 for 3 similar T-shirts and some skirts. There were 2 more skirts than T-shirts.

(a) If a T-shirt costs \$3.90 more than a skirt, find the cost of each T-shirt. [2]

(b) If Mary bought 5 such T-shirts and 6 such skirts, how much more money than Linda did she have to pay? [3]

34. How many even numbers between 10 to 151 are multiples of 3? [5]

35. A light flashes every 1 minute and 10 seconds. Another flashes every 2 minutes. Suppose they flash together at 8:35 a.m. What time both lights will flash again together? [5]

36. George packed 120 kg of sugar into 47 packets. 65% of the sugar was packed equally into 26 [5] packets. The remaining sugar was packed equally into smaller packets. Find the total weight of 10 big packets and 10 small packets of sugar.

37. In a class, 60% of the pupils are girls. 25% of the girls and 15% of the boys like to eat bananas. [5] What percentage of the pupils like to eat bananas?

38. If a certain number is divided by 2, 3, 4, or 5, the respective remainders are 1, 2, 3, and 4. What is [5] the least natural number that satisfies these conditions?
