

GRADE 6 MATHEMATICS

Factors, Multiples, Primes & Divisibility

Complete Printable Worksheet Pack

1. Factors & Factor Pairs

2. Multiples & Common Multiples

3. Prime & Composite Numbers

4. Divisibility Rules

5. Prime Factorisation, HCF & LCM

6. Challenge & Number Reasoning

6 worksheets + separate answer keys • A4 print-ready

Worksheet 1: Factors & Factor Pairs

Move beyond listing factors: use factor structure and reasoning.

A. Factor Pairs

1. List all factor pairs of 48.

2. List all factors of 72 in ascending order.

3. How many factors does 60 have? List them.

4. Find the missing factor: $14 \times \underline{\quad} = 98$.

5. Which has more factors: 36 or 40? Show the factors that justify your answer.

B. Factor Reasoning

6. A number has exactly 3 positive factors. What type of number must it be? Give an example.

7. Find the greatest common factor of 24 and 36.

8. A rectangle has area 84 cm^2 and whole-number side lengths. Give all possible side-length pairs.

9. Find the smallest number greater than 50 that has exactly 10 positive factors.

Answer Key 1: Factors & Factor Pairs

Solutions

1. (1,48), (2,24), (3,16), (4,12), (6,8).
2. 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72.
3. 12 factors: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60.
4. 7.
5. 36 has 9 factors; 40 has 8 factors. So 36 has more.
6. A square of a prime number; example 49, with factors 1, 7, 49.
7. 12.
8. 1×84 , 2×42 , 3×28 , 4×21 , 6×14 , 7×12 .
9. 54. Its positive factors are 1,2,3,6,9,18,27,54, so this has 8, not 10. Therefore 54 is not correct; the smallest >50 with exactly 10 factors is 48? But it is not >50 . 60 has 12 factors. 72 has 12. 80 has 10 factors, so the answer is 80.

Worksheet 2: Multiples & Common Multiples

Use patterns in multiples to solve practical and reasoning problems.

A. Multiples

1. Write the first eight multiples of 12.

2. Write the first five multiples of 18 greater than 50.

3. Is 156 a multiple of 12? Explain.

4. Find the smallest multiple of 15 that is greater than 200.

5. Find the first three common multiples of 6 and 8.

B. Common Multiples & Real Life

6. Two lights flash every 6 seconds and 8 seconds. If they flash together now, after how many seconds will they flash together again?

7. A bus arrives every 12 minutes and another every 18 minutes. They arrive together at 8:00. When will they next arrive together?

8. Find the least common multiple of 9 and 15.

9. Find the least common multiple of 12 and 20.

10. A number is a multiple of both 8 and 12 and lies between 100 and 150. What possibilities are there?

Answer Key 2: Multiples & Common Multiples

Solutions

1. 12, 24, 36, 48, 60, 72, 84, 96.

2. 54, 72, 90, 108, 126.

3. Yes. $156 \div 12 = 13$.

4. 210.

5. 24, 48, 72.

6. 24 seconds.

7. 8:36.

8. 45.

9. 60.

10. 120 only.

Worksheet 3: Prime & Composite Numbers

Use prime structure, factor pairs and prime tests.

A. Classify

1. Classify each as prime or composite: 17, 21, 29, 39, 41, 51.

2. Write all prime numbers between 30 and 50.

3. Explain why 91 is composite.

4. Find the smallest prime number greater than 50.

5. Is 97 prime? Give a reason.

B. Prime Reasoning

6. A composite number has 2, 3, 4, 5, 6, 7 and 8 as factors. What is the number?

7. Can the sum of two prime numbers be odd? Give an example and explain.

8. Find two different prime numbers whose product is 143.

9. Find all prime factors of 84.

10. Challenge: What is the only even prime number, and why is it unique?

Answer Key 3: Prime & Composite Numbers

Solutions

1. 17 prime; 21 composite; 29 prime; 39 composite; 41 prime; 51 composite.
2. 31, 37, 41, 43, 47.
3. $91 = 7 \times 13$, so it has factors other than 1 and itself.
4. 53.
5. Yes. $\sqrt{97}$ is less than 10, and 97 is not divisible by 2, 3, 5 or 7.
6. 840, because its factors include 2, 3, 4, 5, 6, 7 and 8.
7. Yes. $2 + 3 = 5$. The sum of an even prime and an odd prime is odd.
8. 11 and 13.
9. 2, 3 and 7.
10. 2; it is the only prime divisible by 2.

Worksheet 4: Divisibility Rules

Use divisibility rules to test numbers quickly—without long division.

A. Test Divisibility

1. Which of these are divisible by 2: 4,738; 5,421; 8,096; 9,315?

2. Which are divisible by 3: 4,218; 5,427; 7,214; 8,101?

3. Which are divisible by 5: 3,415; 7,238; 9,650; 12,004?

4. Which are divisible by 9: 3,645; 4,218; 7,632; 8,145?

5. Which are divisible by 10: 5,430; 7,215; 9,080; 12,341?

B. Missing Digits

6. Find all possible digits for ■ in 4,5■2 so the number is divisible by 3.

7. Find the smallest digit ■ that makes 72■ divisible by 5.

8. Find a digit ■ so that 6,4■8 is divisible by 9.

9. Find the greatest digit ■ so that 3■6 is divisible by 2 and 3.

10. Can 5,432 be divisible by 6? Explain.

Answer Key 4: Divisibility Rules

Solutions

1. 4,738 and 8,096.
2. 4,218 and 5,427.
3. 3,415 and 9,650.
4. 3,645 and 8,145.
5. 5,430 and 9,080.
6. Digits sum to $11 + \blacksquare$; to be divisible by 3, $\blacksquare = 1, 4$ or 7 .
7. 0 or 5 works; the smallest is 0.
8. 6,408 has digit sum 18, so $\blacksquare = 0$.
9. $3\blacksquare6$ is divisible by 2 automatically; digit sum $9 + \blacksquare$ must be divisible by 3. Greatest possible digit is 9.
10. Yes. It is even and $5 + 4 + 3 + 2 = 14$, which is not divisible by 3. Therefore it is NOT divisible by 6.

Worksheet 5: Prime Factorisation, HCF & LCM

Use prime factors to solve higher-level number problems.

A. Prime Factorisation

1. Write 36 as a product of prime factors.

2. Write 84 as a product of prime factors.

3. Write 120 as a product of prime factors.

4. Write 225 as a product of prime factors.

5. Use prime factors to find the HCF of 36 and 48.

B. HCF & LCM

6. Find the HCF of 48 and 72.

7. Find the LCM of 18 and 24.

8. Find the HCF of 84 and 126.

9. Find the LCM of 15 and 20.

10. Two numbers have HCF 6 and LCM 72. One number is 18. What is the other number?

11. Two bells ring every 20 minutes and 30 minutes. They ring together at 9:00. When will they next ring together?

Answer Key 5: Prime Factorisation, HCF & LCM

Solutions

1. $36 = 2^2 \times 3^2$.
2. $84 = 2^2 \times 3 \times 7$.
3. $120 = 2^3 \times 3 \times 5$.
4. $225 = 3^2 \times 5^2$.
5. $\text{HCF}(36, 48) = 12$.
6. 24.
7. 72.
8. 42.
9. 60.
10. 24, because $18 \times 24 = 6 \times 72$.
11. 10:00.

Worksheet 6: Factors, Multiples & Divisibility Challenge

Use several ideas together. Show enough working to justify your answer.

Challenge

1. Find the smallest number greater than 100 that is divisible by 6, 8 and 9.

2. A number has exactly four positive factors, and two of them are 1 and 13. Give a possible number.

3. Find the smallest positive number that is a multiple of 15 and has exactly 12 positive factors.

4. Two numbers have HCF 8 and LCM 120. One number is 24. Find the other.

5. A school has between 200 and 300 students. They can be arranged equally in groups of 8, 10 or 12 with no students left over. How many students are there?

6. Find the smallest number that leaves remainder 2 when divided by 5 and remainder 3 when divided by 7.

7. True or false: Every multiple of a prime number is composite. Explain.

8. Challenge: Find the smallest number greater than 50 that is both a perfect square and a multiple of 6.

Answer Key 6: Factors, Multiples & Divisibility Challenge

Solutions

1. 144, because $\text{LCM}(6,8,9) = 72$ and the next multiple greater than 100 is 144.
2. 169. Its factors are 1, 13 and 169, so this has only three factors; therefore it does not satisfy the clue. A valid example is $13^3 = 2197$, whose factors include 1, 13, 169 and 2197. It has exactly four factors.
3. 60. Its factors are 1,2,3,4,5,6,10,12,15,20,30,60: exactly 12.
4. 40, because $\text{HCF}(24,40)=8$ and $\text{LCM}(24,40)=120$.
5. 240. It is divisible by 8, 10 and 12.
6. 17. It gives remainder 2 on division by 5 and remainder 3 on division by 7.
7. False. A prime number is itself a multiple of itself and is not composite.
8. 144: it is 12^2 and divisible by 6.