

Boost Free Lessons - Year 7 Maths

Lesson 4: Prime and Composite Numbers

Name: _____ Grade: _____ Date: _____

Worked Example 1

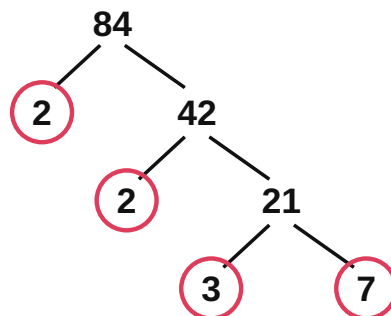
Is 51 a prime number or a composite number?

1. A prime number has exactly two factors: 1 and itself. A composite number has more than two.
2. 51 is odd, so it is not divisible by 2.
3. The digits add to $5 + 1 = 6$, which is divisible by 3, so 51 is divisible by 3: $51 \div 3 = 17$.
4. The factors of 51 are 1, 3, 17 and 51. That is four factors.

51 is composite

Worked Example 2

Write 84 as a product of its prime factors.



1. Divide by the smallest prime that goes in: $84 \div 2 = 42$.
2. Keep going: $42 \div 2 = 21$.
3. 21 is odd, so try the next prime: $21 \div 3 = 7$.
4. 7 is prime, so stop.
5. Now collect every prime you used. You divided by 2, then 2, then 3, and the last answer was 7.
6. The factor tree above shows the same thing. Split each number into two factors until every branch ends in a prime, then multiply all the circled numbers together.

$$84 = 2 \times 2 \times 3 \times 7 = 2^2 \times 3 \times 7$$

Remember: 1 is neither prime nor composite. 2 is the only even prime number.



Question 1: State whether each number is **prime** or **composite**.

1. 17

2. 21

3. 29

4. 33

5. 2

6. 45

7. 41

8. 57

9. 63

10. 97



Question 2: Write each number as a product of its prime factors.

1. 12

2. 30

3. 48

4. 75

5. 100

6. 90

7. 144

8. 210



Question 3: Answer the following questions.

1. List all the prime numbers between 20 and 40.
2. A number has exactly two factors. What can you say about that number?
3. Explain why 1 is not classed as a prime number.
4. Find the two prime numbers that multiply together to give 91.
5. Amir says "All odd numbers are prime." Give an example that shows he is wrong.



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Answers : Prime and Composite Numbers**Question 1**

1. prime
2. composite
3. prime
4. composite
5. prime
6. composite
7. prime
8. composite (3×19)
9. composite
10. prime

Question 2

1. $2^2 \times 3$
2. $2 \times 3 \times 5$
3. $2^4 \times 3$
4. 3×5^2
5. $2^2 \times 5^2$
6. $2 \times 3^2 \times 5$
7. $2^4 \times 3^2$
8. $2 \times 3 \times 5 \times 7$

Question 3

1. 23, 29, 31, 37
2. It is a prime number.
3. It has only one factor (itself), and a prime must have exactly two.
4. 7×13
5. 9 is odd but has factors 1, 3 and 9, so it is composite. (15, 21, 25 also work.)

