



WORKSHEET 3

Year 6 Mathematics: Number & Patterns

Prime & Composite Numbers

Focus: Identifying Prime and Composite Numbers

Name: _____ Date: _____

Key Definitions

Prime Number: A number greater than 1 that has exactly TWO factors (1 and itself).

Examples: 2, 3, 5, 7, 11, 13...

Composite Number: A number that has MORE than two factors.

Examples: 4, 6, 8, 9, 10, 12...

Special Case: The number 1 is NEITHER prime nor composite (it has only one factor).

Section 1: True or False (Fluency)

1. 17 is a prime number. (True or False?)

Answer: _____

2. 9 is a prime number because it is an odd number. (True or False?)

Answer: _____

3. The number 2 is the only even prime number. (True or False?)



Answer: _____

4. The number 1 is a prime number. (True or False?)

Answer: _____

5. All prime numbers are odd numbers. (True or False?)

Answer: _____

6. 21 is a composite number. (True or False?)

Answer: _____

PRIME PROFESSIONAL!



Prime Parrot

Why did 7 eat 9?

Because you're supposed to eat 3 squared meals a day!

Section 2: List the Factors (Reasoning)

7. List all factors of 15. Is 15 prime or composite?

Answer: _____



8. List all factors of 19. Is 19 prime or composite?

Answer: _____

9. List all factors of 24. Is 24 prime or composite?

Answer: _____

10. List all factors of 29. Is 29 prime or composite?

Answer: _____

11. Circle all the prime numbers in this list: 11, 12, 13, 14, 15, 16, 17, 18

Answer: _____

FACTOR FANATIC!



Factor Fox

What did the zero say to the eight?

Nice belt!

Section 3: Number Detective (Challenge)

12. I am a number between 20 and 30. I have exactly two factors. The sum of my digits is 5. What number am I?

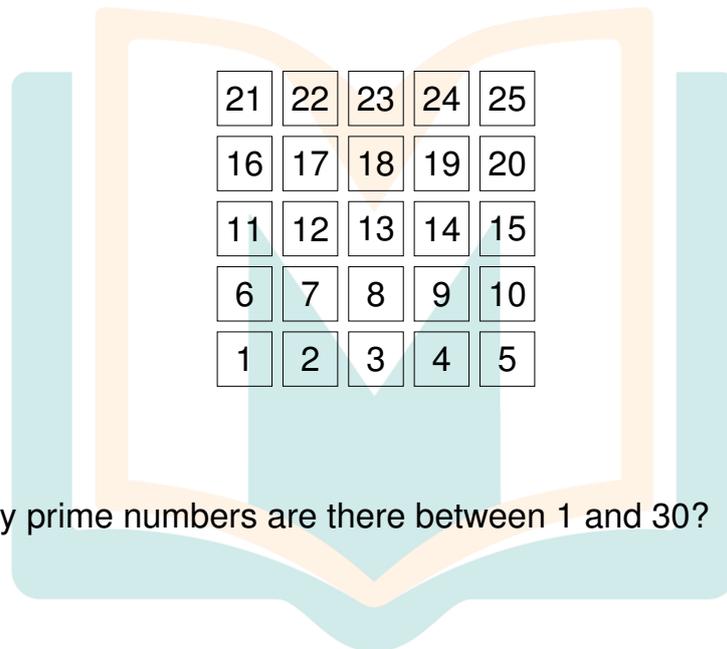


Answer: _____

13. I am a prime number less than 20. If you reverse my digits, you get another prime number. What number could I be? (Give one example)

Answer: _____

14. Use the mini number grid below. Circle all the prime numbers between 1 and 25.



15. How many prime numbers are there between 1 and 30?

Answer: _____

16. Twin primes are pairs of prime numbers that differ by 2 (e.g., 3 and 5). Find another pair of twin primes less than 20.

Answer: _____



NUMBER NINJA!

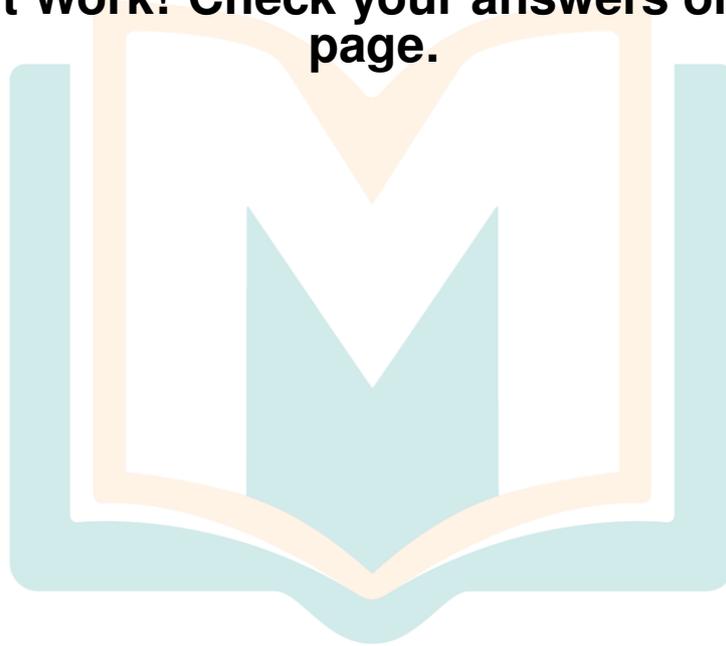


Calculator Pal

Why is 6 afraid of 7?

Because 7 is a prime suspect in the case of the missing 9!

Excellent Work! Check your answers on the next page.





ANSWER KEY

Worksheet 3: Prime & Composite Numbers

Section 1: True or False

1. True (17 has only two factors: 1 and 17)
2. False (9 has factors: 1, 3, 9, so it is composite)
3. True (2 is the only even prime)
4. False (1 is neither prime nor composite)
5. False (2 is prime and even)
6. True (21 has factors: 1, 3, 7, 21)

Section 2: List the Factors

7. Factors: 1, 3, 5, 15. Composite
8. Factors: 1, 19. Prime
9. Factors: 1, 2, 3, 4, 6, 8, 12, 24. Composite
10. Factors: 1, 29. Prime
11. Prime numbers: 11, 13, 17

Section 3: Number Detective

12. 23 (factors: 1, 23; digits: $2 + 3 = 5$)
13. 13 and 31 (or 17 and 71, or 11, or 79 and 97)
14. Prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23
15. 10 prime numbers (2, 3, 5, 7, 11, 13, 17, 19, 23, 29)
16. Twin primes: 5 and 7, or 11 and 13, or 17 and 19



WORKSHEET 4

Year 6 Mathematics: Number & Patterns

Prime & Composite Numbers

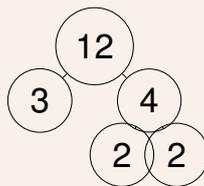
Focus: Factor Trees and Problem Solving

Name: _____ Date: _____

Factor Trees - How They Work

A **Factor Tree** breaks a composite number down into its prime factors.

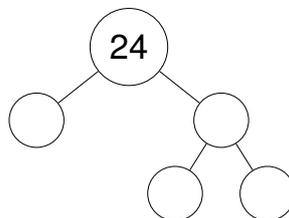
Example: Factor Tree for 12



Prime factors of 12: 2, 2, 3 (or $2^2 \times 3$)

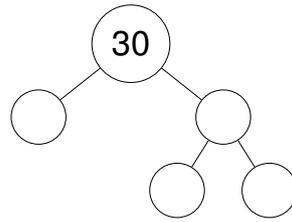
Section 1: Factor Trees (Fluency)

1. Complete the factor tree for the number 24.



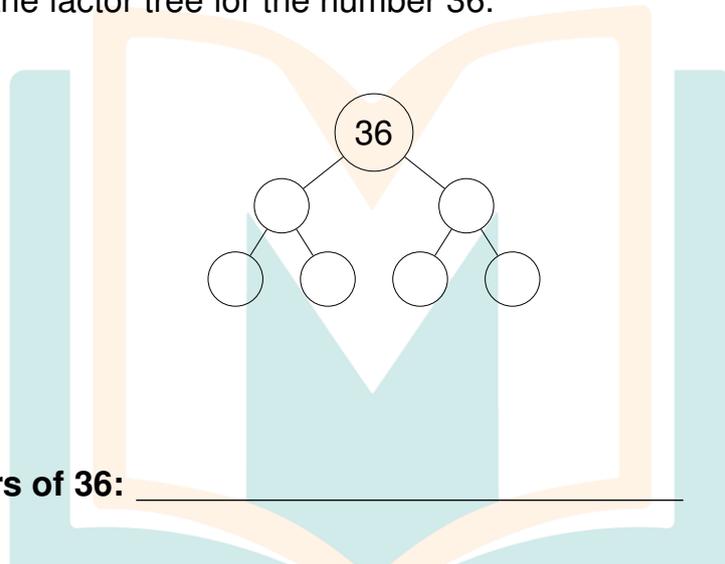
Prime Factors of 24: _____

2. Complete the factor tree for the number 30.



Prime Factors of 30: _____

3. Complete the factor tree for the number 36.



Prime Factors of 36: _____

TREE CHAMPION!



Factor Tree

What did the tree say to the wind?
Leaf me alone, I'm working on my factors!

Section 2: Square Numbers (Reasoning)

4. Why are all square numbers (except 1) composite numbers? Give an example.



Answer: _____

5. Find a prime number greater than 10 that ends in the digit 1.

Answer: _____

6. Is 49 a prime or composite number? Explain your answer.

Answer: _____

7. List all prime numbers between 30 and 50.

Answer: _____

8. Can an even number greater than 2 be prime? Explain why or why not.

Answer: _____

9. What is the smallest composite number?

Answer: _____

REASONING ROCKSTAR!



Super Star

Why was the number 4 always square?
Because it never wanted to be a rectangle!



Section 3: Goldbach's Conjecture (Challenge)

10. Goldbach's Conjecture says that every even number greater than 2 can be made by adding two prime numbers. Find two primes that add up to 20.

Answer: _____

11. Find two prime numbers that add up to 30.

Answer: _____

12. Find two prime numbers that add up to 50.

Answer: _____

13. Can you write 15 as the sum of two prime numbers? (Hint: One prime is 2)

Answer: _____

14. The largest two-digit prime number is 97. What is the smallest two-digit prime number?

Answer: _____

15. A mystery number has exactly 3 factors. What can you say about this number? (Hint: Think about square numbers)



Answer: _____

CONJECTURE CHAMPION!

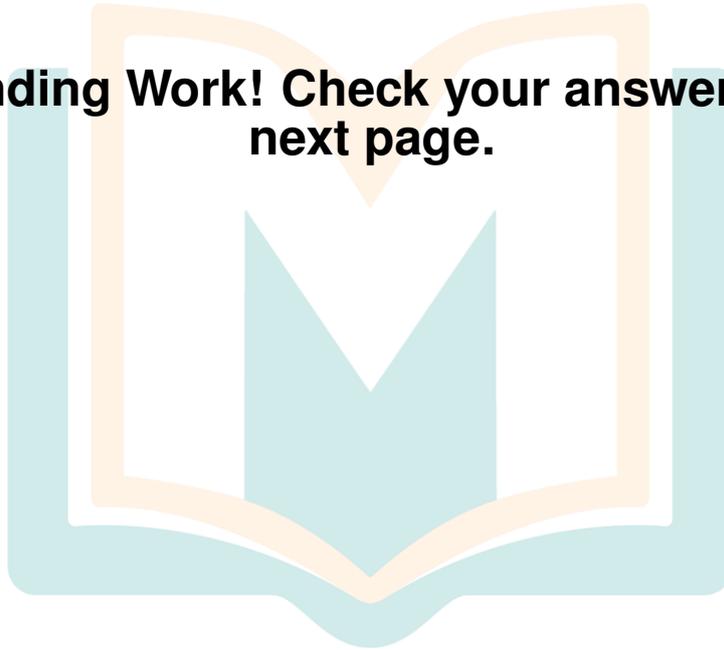


Gold Medal

What do you call friends who love prime numbers?

Prime-mates!

Outstanding Work! Check your answers on the next page.





ANSWER KEY

Worksheet 4: Factor Trees & Problem Solving





Section 1: Factor Trees

1. Factor Tree for 24:

- One possible solution: $24 = 3$ and 8 , then $8 = 2$ and 4 , then $4 = 2$ and 2
- Another: $24 = 4$ and 6 , then $4 = 2$ and 2 , then $6 = 2$ and 3
- Prime Factors: $2, 2, 2, 3$ (or $2^3 \times 3$)

2. Factor Tree for 30:

- One possible solution: $30 = 5$ and 6 , then $6 = 2$ and 3
- Another: $30 = 2$ and 15 , then $15 = 3$ and 5
- Prime Factors: $2, 3, 5$

3. Factor Tree for 36:

- One possible solution: $36 = 6$ and 6 , then $6 = 2$ and 3 (for both)
- Another: $36 = 4$ and 9 , then $4 = 2$ and 2 , then $9 = 3$ and 3
- Prime Factors: $2, 2, 3, 3$ (or $2^2 \times 3^2$)

Section 2: Square Numbers

4. Square numbers (except 1) are composite because they have at least three factors: 1, the number itself, and the square root. Example: 16 has factors 1, 2, 4, 8, 16.

5. 11, 31, 41, 61, 71, etc. (Any correct answer accepted)

6. 49 is composite. Factors: 1, 7, 49 (more than two factors)

7. Prime numbers between 30 and 50: 31, 37, 41, 43, 47

8. No. All even numbers greater than 2 are divisible by 2, so they have at least three factors (1, 2, and themselves), making them composite.

9. 4 (factors: 1, 2, 4)

Section 3: Goldbach's Conjecture

10. $3 + 17 = 20$, or $7 + 13 = 20$ (both acceptable)

11. $7 + 23 = 30$, or $11 + 19 = 30$, or $13 + 17 = 30$

12. $3 + 47 = 50$, or $7 + 43 = 50$, or $13 + 37 = 50$, or $19 + 31 = 50$

13. $2 + 13 = 15$ (Note: 15 is odd, so we need the even prime 2)

14. 11



Amazing Achievement!

You've mastered Prime & Composite Numbers!
You're a true Factor Detective!

