

Prime Factorization worksheet

Name: _____ Class: _____ Date: _____

Quick Reminder

Prime factorization means writing a number as a product of prime numbers.

Example: $60 = 2 \times 2 \times 3 \times 5 = 2^2 \times 3 \times 5$

A. Find the Prime Factors

Write the prime factorization of each number.

(1) $12 =$ _____

(2) $18 =$ _____

(3) $20 =$ _____

(4) $24 =$ _____

(5) $30 =$ _____

(6) $36 =$ _____

(7) $40 =$ _____

(8) $45 =$ _____

B. Use a Factor Tree

Draw a factor tree and find the prime factorization.

1. 48 Factorization: _____

2. 54 Factorization: _____

3. 60 Factorization: _____

4. 72 Factorization: _____

5. 84 Factorization: _____

6. 90 Factorization: _____

C. Write Using Exponents

Write each prime factorization using powers.

1. $24 = 2 \times 2 \times 2 \times 3$ = _____

2. $36 = 2 \times 2 \times 3 \times 3$ = _____

3. $72 = 2 \times 2 \times 2 \times 3 \times 3$ = _____

4. $100 = 2 \times 2 \times 5 \times 5$ = _____

5. $180 = 2 \times 2 \times 3 \times 3 \times 5$ = _____

D. Find the Missing Prime Factor

1. $20 = 2 \times 2 \times \underline{\hspace{2cm}}$
2. $30 = 2 \times 3 \times \underline{\hspace{2cm}}$
3. $42 = 2 \times 3 \times \underline{\hspace{2cm}}$
4. $56 = 2 \times 2 \times 2 \times \underline{\hspace{2cm}}$
5. $75 = 3 \times 5 \times \underline{\hspace{2cm}}$
6. $110 = 2 \times 5 \times \underline{\hspace{2cm}}$

E. True or False? Write True or False.

1. The prime factors of 12 are 2 and 3.
2. $36 = 2^2 \times 3^2$.
3. $25 = 5 \times 5$.
4. $42 = 2 \times 3 \times 7$.
5. $50 = 2 \times 5^2$.
6. $27 = 3^2$.

F. Find the prime factorization of:

1. $96 = \underline{\hspace{4cm}}$
2. $108 = \underline{\hspace{4cm}}$
3. $120 = \underline{\hspace{4cm}}$
4. $144 = \underline{\hspace{4cm}}$
5. $150 = \underline{\hspace{4cm}}$
6. $180 = \underline{\hspace{4cm}}$
7. $210 = \underline{\hspace{4cm}}$
8. $225 = \underline{\hspace{4cm}}$

G. Think & Solve

1. A number has prime factorization: $2^3 \times 3 \times 5$ What is the number? Answer:
2. A number has prime factorization: $2^2 \times 3^2$ What is the number? Answer:
3. Which number has the prime factorization $2 \times 3 \times 5 \times 7$? Answer:
4. Write a number whose prime factorization is: $2^2 \times 5$ Answer:

H

Find the prime factorization of 360. $360 = \underline{\hspace{4cm}}$