Powers and prime factors: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Write each product using index notation.

(a) $5 \times 5 \times 5$

(b) $2 \times 2 \times 2 \times 2 \times 2 \times 2$

(c) $7 \times 7 \times 3 \times 3 \times 3$

Question 2

Evaluate:

(a) 2^5

(b) 3^4

(c) 10^3

Question 3

Which of these numbers are prime?

1, 2, 9, 15, 17, 21, 23, 27, 29

Question 4

Write each number as a power of 10.

(a) 1000

(b) 1 000 000

(c) $10 \times 10 \times 10 \times 10 \times 10$

Section B: Standard (Questions 5-10)

Question 5

Write 4352 in expanded notation using powers of 10.

Question 6

Write 70 609 in expanded notation using powers of 10.

Question 7

Write the number that is equal to $3 \times 10^5 + 2 \times 10^3 + 8 \times 10^1 + 4 \times 10^0$.

Question 8

Use a factor tree to write 60 as a product of its prime factors. Give your answer in index notation.

Question 9

Write each number as a product of powers of primes.

(a) 72

(b) 180

Question 10

Which number has the prime factorisation $2^3 \times 3^2 \times 5$?

Powers and prime factors: answers

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Question 1

Answer: (a) 5^3 (b) 2^6 (c) $7^2 \times 3^3$

Question 2

Answer: (a) 32 (b) 81 (c) 1000

Question 3

Answer: 2, 17, 23, 29

Question 4

Answer: (a) 10^3 (b) 10^6 (c) 10^5

Question 5

Answer: $4 \times 10^3 + 3 \times 10^2 + 5 \times 10^1 + 2 \times 10^0$ (also accept … + 5 × 10 + 2 × 1)

Question 6

Answer: $7 \times 10^4 + 6 \times 10^2 + 9 \times 10^0$ (zero digits may be shown as 0×10^3 and 0×10^1)

Question 7

Answer: 302,084

Question 8

Answer: $2^2 \times 3 \times 5$

Question 9

Answer: (a) $2^3 \times 3^2$ (b) $2^2 \times 3^2 \times 5$

Question 10

Answer: 360 (8 × 9 × 5)