Whole numbers, factors and powers topic test

15 questions | 32 marks | 45 minutes

A progressive by-hand review of place value, calculations, factors, powers and estimates.

Equivalent correct methods earn the corresponding marks.

1. What is the value of the 6 in 3,642,015? [1 mark]

The 6 occupies the hundred-thousands position.

$6 \times 100{,}000 = 600{,}000$.

Answer: 600,000

2. Write 4,000 + 70 + 9 as one whole number. [1 mark]

Add the place-value parts.

A zero holds the hundreds position.

Answer: 4,079

3. Evaluate 6×10^4. [1 mark]

$10^4 = 10{,}000$.

$6 \times 10{,}000 = 60{,}000$.

Answer: 60,000

4. Evaluate $18 + 24 \div 6$. [2 marks]

Division first: $24 \div 6 = 4$.

Then $18 + 4 = 22$.

Answer: 22

5. Evaluate $(20 - 8) \times 3$. [2 marks]

The bracket gives 12.

$12 \times 3 = 36$.

Answer: 36

6. List every positive factor pair of 45. [3 marks]

Check integers from 1 upward until the factor pairs begin to repeat.

The three products are 1×45, 3×15 and 5×9.

Answer: 1 and 45; 3 and 15; 5 and 9.

7. Is 49 prime? Give a reason. [2 marks]

A prime has exactly two positive factors.

49 also has the factor 7, so it is composite.

Answer: No; $49 = 7 \times 7$.

8. Find the highest common factor of 18 and 42. [2 marks]

The common factors are 1, 2, 3 and 6.

The greatest is 6.

Answer: 6

9. Find the lowest common multiple of 8 and 12. [2 marks]

Multiples of 8 include 8, 16, 24.

Multiples of 12 include 12, 24.

Answer: 24

10. Write 90 as a product of prime powers. [3 marks]

$90 = 9 \times 10$.

Replace these by prime factors: $3^2 \times 2 \times 5$.

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

11. Evaluate $\sqrt{225}$. [1 mark]

$15 \times 15 = 225$, so the principal root is 15.

Answer: 15

12. A square has area 144 square centimetres. Find its side length and perimeter. [4 marks]

(a) Find the side length. [2 marks]

$\sqrt{144} = 12$.

Answer: 12 cm

(b) Find the perimeter. [2 marks]

$4 \times 12 = 48$ cm.

Answer: 48 cm

13. Round 4,970 to the nearest hundred. [1 mark]

The tens digit is 7, so 49 hundreds rounds up to 50 hundreds.

Answer: 5,000

14. Estimate 39×202 using convenient whole numbers. [2 marks]

Use $40 \times 200 = 8000$.

The estimate gives a useful check on the size of the product.

Answer: About 8,000

15. A trip takes 96 students. Each bus seats 24 students and costs 185 dollars to hire. Entry costs 7 dollars per student. Find the number of buses and the total cost. [5 marks]

(a) How many buses are needed? [1 mark]

$96 \div 24 = 4$.

Answer: 4

(b) Find the total cost of bus hire. [2 marks]

$4 \times 185 = 740$.

Answer: 740 dollars

(c) Find the total cost of bus hire and entry. [2 marks]

$96 \times 7 = 672$.

$740 + 672 = 1412$.

Answer: 1,412 dollars