

1.1 Integers and the four rules

Name: _____ Class: _____ Date: _____ **Total: 16 marks**

KEY WORDS prime number • factor

Integers and the four rules

Objective

Order integers, compute with directed numbers, apply the hierarchy of operations, and use the number-classification vocabulary (objectives Foundation 1.1 A–H).

1 Key knowledge and worked examples

Order and the four rules. The number line orders integers; same signs add, different signs subtract, two negatives make a positive. BIDMAS: brackets, indices, divide/multiply, add/subtract. For example, $3 + 4 \times 2^2 = 19$ but $(3 + 4) \times 2 = 14$.

Classification. Odd, even, prime (exactly two factors), factors and multiples. Primes under 20: 2, 3, 5, 7, 11, 13, 17, 19. Common factors and common multiples prepare the HCF and LCM.

$72 = 2^3 \times 3^2$

$90 = 2 \times 3^2 \times 5$

Shared smallest powers: $2 \times 3^2 = 18$

Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 Work out $-7 + 12$ [1]

2.2 Work out $3 + 4 \times 2^2$ [2]

2.3 Work out $(-8) \div (-2)$ [1]

2.4 List all the prime numbers less than 20 [2]

2.5 List all the factors of 36 [2]

3 Exam-style questions

3.1 (*Original.*) A submarine at -45 m rises 28 m, then dives 60 m. (a) Find its final depth. (b) Write the calculation using directed numbers. [3]

3.2 (*Original.*) Work out $\frac{(4-6)^2 \times 5}{-10}$, showing one step per line. [3]

3.3 (*Original.*) A number is even, a multiple of 7 and between 20 and 50. Write down the two possibilities. [2]

Solutions

2.1 5.

2.2 $4 \times 4 = 16$, then $3 + 16 = 19$.

2.3 4.

2.4 2, 3, 5, 7, 11, 13, 17, 19.

2.5 1, 2, 3, 4, 6, 9, 12, 18, 36.

3.1 (a) $-45 + 28 = -17$, then $-17 - 60 = -77$: 77 m below sea level. (b) $-45 + 28 - 60 = -77$.

3.2 $(4 - 6)^2 = (-2)^2 = 4$; $4 \times 5 = 20$; $20 \div (-10) = -2$.

3.3 Multiples of 7 between 20 and 50: 21, 28, 35, 42, 49; the even ones are 28 and 42.

Local review guidance: one operation per line in hierarchy questions; exact values; classification answers list ALL members asked for. This is authored classroom guidance.