PROPERTIES OF INTEGERS

A NUMBERS 1 AND 0

A.1 APPLYING NUMBER PROPERTIES

Ex 1: Calculate the following expression without using a calculator:

$$(4 \times 22 + 3 + 22 \div 2) \times 0 = \square$$

Ex 2: Consider the following sequence of algebraic manipulations:

$$0 \times 2 = 0 \quad \text{Line 1}$$
$$2 = \frac{0}{0} \quad \text{Line 2} \quad \text{(dividing by 0)}$$
$$2 = \frac{1 \times \emptyset}{1 \times \emptyset} \quad \text{Line 3} \quad \text{(cancelling common factor)}$$
$$2 = 1 \quad \text{Line 4}$$

This sequence appears to show that $2 = 1$, which is a false result. Identify the line where an invalid mathematical operation is performed.

The error occurs in Line $\square$

Ex 3: Calculate the following expression without using a calculator:

$$2 + (120 - 45) \times (200 - 200) = \square$$

Ex 4: Calculate the following expression without using a calculator:

$$(15 + 3 \times 5 - 30) \times (100 \times 11) = \square$$

B DIVISION WITH REMAINDERS

B.1 CALCULATING THE DIVISION WITH REMAINDERS

Ex 5: Write the division with remainder of 21 by 5:

$$21 = 5 \times \square + \square$$

Ex 6: Write the division with remainder of 37 by 3:

$$37 = 3 \times \square + \square$$

Ex 7: Write the division with remainder of 63 by 4:

$$63 = 4 \times \square + \square$$

Ex 8: Write the division with remainder of 154 by 6:

$$154 = 6 \times \square + \square$$

Ex 9: Write the division with remainder of 632 by 5:

$$632 = 5 \times \square + \square$$

B.2 SOLVING REAL-WORLD PROBLEMS

Ex 10: A farmer shares 243 eggs into boxes such that each box contains 6 eggs.
How many boxes are needed?

$\square$ boxes

How many eggs remain without being placed in a box?

$\square$ eggs

Ex 11: A farmer's inheritance of 123 sheep is to be divided equally among 4 children.
How many sheep does each child receive?

$\square$ sheep

How many sheep remain undistributed?

$\square$ sheep

Ex 12: A gardener arranges 200 roses into bouquets such that each bouquet contains 12 roses.
How many bouquets are needed?

$\square$ bouquets

How many roses remain without being placed in a bouquet?

$\square$ roses

Ex 13: A child entering middle school decides to give his 300 marbles to his 7 cousins.
How many marbles does each cousin receive?

$\square$ marbles

How many marbles remain undistributed?

$\square$ marbles

Ex 14: A coach organizes 37 soccer players into teams such that each team contains 5 players. The remaining players are substitutes.
How many full teams can be formed?

$\square$ teams

How many players are substitutes?

$\square$ players

C DIVISIBILITY

C.1 DETERMINING DIVISIBILITY

MCQ 15: Is 10 divisible by 5?

- ☐ Yes
- ☐ No

MCQ 16: Is 82 divisible by 4?

☐ Yes

☐ No

MCQ 17: Is 72 divisible by 5?

☐ Yes

☐ No

MCQ 18: Is 234 divisible by 3?

☐ Yes

☐ No

C.2 DETERMINING MULTIPLICITY

MCQ 19: Is 73 a multiple of 9?

☐ Yes

☐ No

MCQ 20: Is 77 a multiple of 11?

☐ Yes

☐ No

MCQ 21: Is 50 a multiple of 4?

☐ Yes

☐ No

MCQ 22: Is 100 a multiple of 12?

☐ Yes

☐ No

C.3 DETERMINING FACTORS

MCQ 23: Is 10 a factor of 60?

☐ Yes

☐ No

MCQ 24: Which of the following numbers are factors of 64?

Choose all answers that apply:

☐ 2

☐ 4

☐ 8

☐ 32

MCQ 25: Which equation shows that 5 is a factor of 45?

Choose 1 answer:

☐ $45 = 5 + 40$

☐ $45 = 50 - 5$

☐ $45 = 225 \div 5$

☐ $45 = 5 \times 9$

MCQ 26: List all the factors of 6.

Choose 1 answer:

☐ $1, 2, 3, 4, 6$

☐ $1, 2, 3, 6$

☐ $1, 2, 3, 6, 12$

MCQ 27: List all the factors of 24.

Choose 1 answer:

☐ $1, 2, 3, 4, 6, 8, 12, 24$

☐ $1, 2, 3, 4, 6, 8$

☐ $1, 2, 3, 4, 5, 6, 8, 12, 24$

MCQ 28: List all the factors of 40.

Choose 1 answer:

☐ $1, 2, 4, 5, 8, 10, 40$

☐ $1, 2, 4, 5, 8, 10, 12, 20, 40$

☐ $1, 2, 4, 5, 8, 10, 20, 40$

D DIVISIBILITY CRITERIA

D.1 DETERMINING DIVISIBILITY FOR 2 AND 5

MCQ 29: Is 98 divisible by 2?

☐ Yes

☐ No

MCQ 30: Is 315 divisible by 2?

☐ Yes

☐ No

MCQ 31: Is 462 divisible by 2?

☐ Yes

☐ No

MCQ 32: Is 799 divisible by 2?

☐ Yes

☐ No

MCQ 33: Is 45 divisible by 5?

☐ Yes

☐ No

MCQ 34: Is 80 divisible by 5?

☐ Yes

☐ No

MCQ 35: Is 126 divisible by 5?

☐ Yes

☐ No

MCQ 36: Is 301 divisible by 5?

☐ Yes

☐ No

D.2 DETERMINING DIVISIBILITY FOR 3 AND 9

MCQ 37: Is 162 divisible by 3?

☐ Yes

☐ No

MCQ 38: Is 305 divisible by 3?

☐ Yes

☐ No

MCQ 39: Is 888 divisible by 3?

☐ Yes

☐ No

MCQ 40: Is 504 divisible by 3?

☐ Yes

☐ No

MCQ 41: Is 126 divisible by 9?

☐ Yes

☐ No

MCQ 42: Is 235 divisible by 9?

☐ Yes

☐ No

MCQ 43: Is 369 divisible by 9?

☐ Yes

☐ No

MCQ 44: Is 441 divisible by 9?

☐ Yes

☐ No

D.3 DETERMINING DIVISIBILITY FOR 4

MCQ 45: Is 188 divisible by 4?

☐ Yes

☐ No

MCQ 46: Is 373 divisible by 4?

☐ Yes

☐ No

MCQ 47: Is 412 divisible by 4?

☐ Yes

☐ No

MCQ 48: Is 256 divisible by 4?

☐ Yes

☐ No

MCQ 49: Is 179 divisible by 4?

☐ Yes

☐ No

MCQ 50: Is 520 divisible by 4?

☐ Yes

☐ No

MCQ 51: Is 567 divisible by 4?

☐ Yes

☐ No

E PRIME NUMBER

E.1 CHECKING IF PRIME

MCQ 52: State whether 6 is a prime number.

☐ Yes

☐ No

MCQ 53: State whether 5 is a prime number.

☐ Yes

☐ No

MCQ 54: State whether 9 is a prime number.

☐ Yes

☐ No

MCQ 55: State whether 7 is a prime number.

☐ Yes

☐ No

MCQ 56: State whether 12 is a prime number.

☐ Yes

☐ No

MCQ 57: State whether 10 is a prime number.

☐ Yes

☐ No

MCQ 58: State whether 13 is a prime number.

☐ Yes

☐ No

MCQ 59: State whether 11 is a prime number.

☐ Yes

☐ No

F PRIME FACTORIZATION

F.1 WRITING IN PRIME FACTORS: LEVEL 1

Ex 60: Write the number as a product of prime factors :

$6 =$ ☐

Ex 61: Write the number as a product of prime factors :

$14 =$ ☐

Ex 62: Write the number as a product of prime factors :

$25 =$ ☐

Ex 63: Write the number as a product of prime factors :

$22 =$ ☐

F.2 WRITING IN PRIME FACTORS: LEVEL 2

Ex 64: Write the number as a product of prime factors :

$12 =$ ☐

Ex 65: Write the number as a product of prime factors :

$18 =$ ☐

Ex 66: Write the number as a product of prime factors :

$30 =$ ☐

Ex 67: Write the number as a product of prime factors :

$75 =$ ☐

F.3 WRITING IN PRIME FACTORS: LEVEL 3

Ex 68: Write the number as a product of prime factors :

$16 =$ ☐

Ex 69: Write the number as a product of prime factors :

$36 =$ ☐

Ex 70: Write the number as a product of prime factors :

$100 =$ ☐

Ex 71: Write the number as a product of prime factors :

$200 =$ ☐