SANDRINGHAM COLLEGE

7 Mathematics
PRACTICE ALT 4: Number Properties
Name:

DESCRIPTION

In this Assessed Learning Task, you will use you understanding of decimals to answer a variety of questions using the skills listed in the rubric.

Extension	*This section will test your understanding of enrichment levels skills and how you apply enrichment level skills in problem solving and reasoning sections.*
Core	*This section will test your understanding of core levels skills and how you apply core level skills in problem solving and reasoning sections.*
Entry	*This section will test your understanding of entry levels skills and how you apply entry level skills in problem solving and reasoning sections.*

This ASSESSED LEARNING TASK will be used to measure your growth and achievement against the skills and understandings in the unit of work studied before this assessment.

Type of Task:	Test in two sections	
Conditions:	**Section 1:** 60 mins writing time • Technology free • Workbook	**Section 2:** 30 mins writing time • Scientific calculator • Workbook
Materials Allowed	• *Workbook* • *Pen / pencil / eraser*	

KEY SKILLS

	Entry	Core	Enrichment
Powers of a number	Can calculate squares of numbers using a multiplication grid	Can evaluate powers of numbers within times tables	Can substitute into expressions involving powers
Factors and multiples	Can list positive multiples of a number	Part 1: Missing number questions Part 2: Can list the factors of a number under 60	Can list factors of numbers larger than 100
Classifying numbers	Can classify numbers as even or odd. Can use a multiplication grid to identify square numbers.	Can classify numbers as prime, or multiples of 2, 3, 4 or 5	Can write the prime factorisation of a whole number
LCM and HCF	Can work out the LCM of two numbers by listing multiples of each	Can work out the HCF of two numbers by listing factors of each	Using prime factorisations to find LCM and HCF of larger numbers
Square roots	Can calculate the square root of a number with the support of a multiplication grid	Can calculate the square root of a number	Identifying perfect squares and cubes from prime factorisation. Calculating roots of large numbers using prime factorisation
Powers of a number	Can calculate squares of numbers using a multiplication grid	Can evaluate powers of numbers within times tables	Can substitute into expressions involving powers
Applications	Apply entry level skills in a context	Apply entry level skills in a context	Apply extension level skills in a context
Reasoning	Can reason with entry level skills	Can reason with core level skills	Can reason with enrichment level skills

Student Declaration

By submitting this task I declare that this assessment is my individual work after seeking and receiving feedback from my peers and teacher. I have not copied from another student's work or from any other source, except where due acknowledgement is made explicit, nor has any part being written or completed for me by another person.

SECTION 1: ENTRY LEVEL SKILLS

1. Calculate 5^2 *[1A]*

2. List the first 6 positive multiples of 3. *[2A]*

3. Circle the words that describe 25 *[3A]*

   odd even square

4. Determine the LCM of 6 and 9. *[4A]*

5. Calculate $\sqrt{36}$ *[5A]*

x	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	2	4	6	8	10	12	14	16
3	3	6	9	12	15	18	21	24
4	4	8	12	16	20	24	28	32
5	5	10	15	20	25	30	35	40
6	6	12	18	24	30	36	42	48
7	7	14	21	28	35	42	49	56
8	8	16	24	32	40	48	56	64

SECTION 2: CORE LEVEL SKILLS

1. Calculate 2^4. *[1B]*

2. Fill in the box to make the equation true. *[2B Part 1]*

$$5 \times \square = 85$$

3. List the factors of 45 *[2B Part 2]*

4. Circle the words that describe 27. *[3B]*

odd prime multiple of 3

5. Determine the HCF of 40 and 96 the following. *[4B]*

6. Calculate $\sqrt{121}$. *[5B]*

SECTION 3: ENRICHMENT SKILLS

1. Substitute $h = 3$ into $7h^2$. *[1C]*

2. List the factors of 116 *[2C]*

3. Write 72 as a product of prime numbers, use powers for repeated factors *[3C]*

4. What is the HCF of $2^7 \times 3^4 \times 7$ and $3^2 \times 5^2 \times 7^2$? *[4C]*

5. Evaluate $\sqrt{2^4 \times 3^2 \times 7^2}$. *[5C]*

SECTION 4: EXTENSION LEVEL SKILLS

1. Substitute $t = -4$ into $t^2 + 3t$ and evaluate.

2. Find the length and width of the rectangle that has perimeter is 44m and the area is 72m^2.

3. What is the smallest number that can go in the first box? You will need to fill in all gaps to check your answer works.

$$\square =$$
$$= 20 \times \square \times 3$$
$$=$$
$$=$$
$$= 2^3 \times \square \times \square$$

4. The LCM of two numbers is 72 and the HCF of two numbers is 8. What could the two numbers be? Give **two different solutions**.

5. Solve the equation below. Include line by line working and show your use of opposite operations.

$$4\sqrt{x-2} + 7 = 19$$

Student Name……

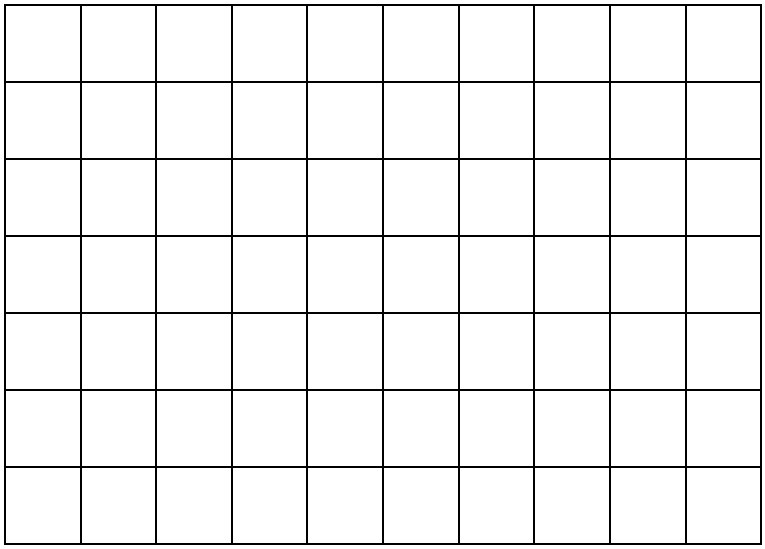
Technology Active – Calculator Allowed

APPLICATION QUESTIONS

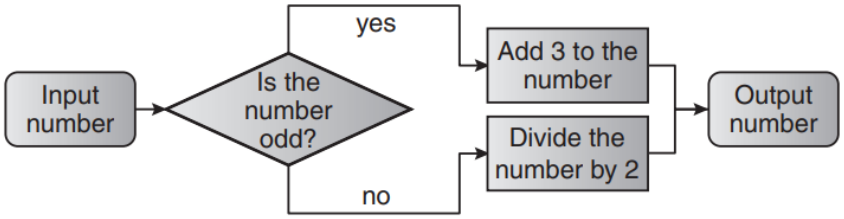
1. A square has an area of 25cm^2.

   a. Draw this square on the grid below. (each square = 1cm^2)

   b. What is the perimeter of the square?



2. This flowchart shows the rules for a number game.



The output number is 16.

What are two possible values for the input number?

8 and 13	8 and 19	13 and 32	19 and 32
⬭	⬭	⬭	⬭

3. Who am I?

- I have three digits.
- I am divisible by 5.
- I am odd.
- The product of my digits is 15.
- The sum of my digits is less than 10.
- I am less than 12×12.

4. Three swimmers take 28 seconds, 44 seconds and 68 seconds to complete a lap of the pool. If they all start together, how long will it be until they are all side by side at one end of the pool again?

REASONING QUESTIONS

1. Explain why two odd numbers add to an even number. You may use an example to support your explanation.

2. George says that bigger numbers have more factors than smaller numbers. Is George always, sometimes or never true? Give examples to support your answer.

3. Can you split the numbers 1, 2, 3, 4, 5 and 6 into two groups that have the same sum? Either show that you can or explain why you can't.

4. The sum of the first n odd numbers is a perfect square. Explain why this is true using a diagram and words.

Other Reasoning Questions for you to practice with:

1. The prime factorisation of a number is $3^2 \times 5 \times 7$. Can you explain why 15 is a factor of this number without calculating the number?
2. George says the number 5.8 is even because it ends with an 8. Explain why George is wrong.
3. 12 cannot be a factor of an odd number. Why not?
4. Both 2 and 8 are factors of a number, will 16 also be a factor? Why/why not?