

## EXTENSION MATHS 15 – 21 SEPTEMBER

### ALGEBRAIC EXPRESSIONS

The First Toki that Hewed the Largest Waka Hourua

Some accounts say that Te Arawa was the largest waka to sail to Aotearoa from Hawaiki.

It was a waka hourua with a whare built onto it. Te Arawa was built by a great master with a toki ( adze), a special tool used in waka building. A toki has an arched blade almost at a right angle to the handle. Two toki were made and, by tradition, each was named.

To find out the name of the first of the toki, read the sentences below and write their corresponding algebraic expressions. The letter beside each question and its answer will give the puzzle code.

A number ( <b>n</b> ) multiplied by seven. <b>A</b>	A number ( <b>n</b> ) divided by seven. <b>C</b>
Seven divided by a number ( <b>n</b> ). <b>T</b>	Seven more than a number ( <b>n</b> ). <b>L</b>
Seven less than a number ( <b>n</b> ). <b>D</b>	The number of cents in <b>n</b> dollars. <b>S</b>
The number of months in <b>n</b> years. <b>I</b>	The number of days in <b>n</b> hours. <b>W</b>
A school bus has 15 students and <b>n</b> more get on at the next stop. Write down the expression for the new number of students in the bus. <b>E</b>	In a class of 31 students, <b>n</b> students are absent. Write down the expression of the number of students present. <b>R</b>
A can of soft drink costs 60 cents. Write down the expression for the cost of <b>n</b> cans in dollars. <b>U</b>	A number ( <b>n</b> ) multiplied by four, and three subtracted from it. <b>L</b>

12n	7/n	24n	n/24	7n	100n	24n	n/7	7n	n +7	4n-3	n+15	n-7

7/n	0.6n	7/n	7n	0.6n	31-n	0.6n

## FACTORS, HIGHEST COMMON FACTOR ( HCF)

### The Meaning of Te Arawa

Some accounts say that Te Arawa was the largest waka hourua ( double-hulled canoe) that came to Aotearoa from Hawaiki.

To find out the meaning of the name of Te Arawa, find the highest common factor (HCF) of the given numbers. The letter beside each question and its answer will give the puzzle code.

14, 35, & 56 <i>A</i>	20 & 35 <i>K</i>	18 & 36 <i>H</i>	63 & 84 <i>F</i>
18 & 45 <i>E</i>	60 & 90 <i>R</i>	16, 24 & 40 <i>O</i>	13, 39 & 52 <i>N</i>
15 & 45 <i>T</i>	32 & 48 <i>A</i>	12, 16 & 20 <i>S</i>	12, 36 & 48 <i>E</i>
45 & 90 <i>D</i>	48 & 72 <i>M</i>	20 & 60 <i>A</i>	42 & 70 <i>F</i>
18 & 24 <i>H</i>	33, 55 & 77 <i>I</i>	19 & 57 <i>K</i>	17 & 51 <i>O</i>
	25, 75, & 100 <i>N</i>		26 & 52 <i>A</i>

15	6	12	2	25	7	24	9	2	8	14	2	16	2	5	11	13	45

17	21	2	20	2	4	18	26	30	19

## ORDER OF OPERATIONS WITH INTEGERS      BEDMAS

If you are unsure please watch the youtube clip.

<https://www.youtube.com/watch?v=oZ33DUC-zPo>

The Name of the Chiefly Headgear

The waka Te Arawa reached Aotearoa at Waiariki ( Bay of Plenty). As they sailed along the bay, they were astonished to see Pohutukawa blooming. They had never seen such a mass of kura( red), the sacred colour. Tauninihi, a young chief of Te Arawa, cried"Therewill be no shortageof kura on this shore!" He took his chiefly headgear, made of red feathers from the parrots of Hawaiki, and threw it into the bay.

To find out the name of the chiefly headgear, evaluate the expressions below. The value of the letters will give the puzzle code.

$48 \div 6 + 24 \div 8 =$ <b>D</b>	$12 \div 4 + 3 \times 5 =$ <b>A</b>	$15 + 4 - 12 + 9 =$ <b>E</b>
$(2 + 5) \times 3 =$ <b>H</b>	$40 \div 8 \times 4 =$ <b>L</b>	$50 - (18 + 6) \div 2 =$ <b>A</b>
$(3 + 6) \times 2 + 7 =$ <b>E</b>	$10 + 3 \times (18 - 3) =$ <b>I</b>	$8 + 3 \times 4 \times 5 =$ <b>H</b>
$(14 + 22) \div (7 - 3) =$ <b>A</b>	$35 \div (8 - 3) =$ <b>T</b>	$30 - (25 - 10) =$ <b>E</b>
$(5 + 2 \times 3) \times 3 =$ <b>D</b>	$15 \times 2 + 54 \div 9 =$ <b>K</b>	$(4 + 8 \times 3) \div (42 \div 6) =$ <b>A</b>
$24 \div 8 \times 6 \div 3 =$ <b>A</b>	$16 \times (5 - 3) =$ <b>R</b>	$(30 \div 3 + 4) \div 7 =$ <b>C</b>
$(15 - 20 \div 4) \div 2 =$ <b>G</b>	$(2 + 16 + 14) \div 4 =$ <b>S</b>	$37 - (17 - 4) =$ <b>L</b>
$9 + 5 \times 4 + 24 \div 4 =$ <b>W</b>	$3 \times 4 + 5 \times 2 =$ <b>E</b>	$20 + 16 - 22 =$ <b>A</b>

7	68	16	3	21	22	18	33	5	15	38	32	3	35	6	8

2	14	20	24	25	11	3	7	4	55	35	68	18	36	9	16	6

## Mahurangi

The people who sailed from Hawaiili to Aotearoa followed the footsteps of the legendary Kupe and explored the land. Names of many places are associated with the waka tipuna (canoe ancestors). Mahurangi is the name of a small town 70 km north of Tāmaki-makau-rau, and its harbour. The place name is linked to the Tainui waka tipuna Mahurangi. What do we know about Mahurangi?

To find out the answer to the question, calculate the expressions below. The letter beside each question and its answer will give the puzzle code.

$10 - 2 \times 7 =$ <b>A</b>	$15 - 5 \times 3 =$ <b>B</b>	$20 - 10 \div 2 =$ <b>C</b>
$-12 - 6 \div 2 =$ <b>D</b>	$15 \div 3 \times 4 =$ <b>E</b>	$5 - 7 \times -2 =$ <b>F</b>
$12 + 4 \times -5 =$ <b>G</b>	$(-2 \times 5)^2 =$ <b>H</b>	$9 - 2 \times (-1)^3 =$ <b>I</b>
$4 - 9 - (-2)^2 =$ <b>L</b>	$2 \times (-5)^2 =$ <b>N</b>	$-2 - 6 \div (14 \div 7) =$ <b>O</b>
$-4 - 6 \div (14 \div 7) =$ <b>R</b>	$(4 - 2 \times 5) \div 3 =$ <b>S</b>	$2 - (42 \div 7) \times 4 =$ <b>T</b>
$(4 - -5) \times 2 =$ <b>U</b>	$10 - (36 \div 12)^2 \times 3 =$ <b>K</b>	$(18 - 3 \times 4)^2 \div 3 =$ <b>W</b>

-2	100	-20	2	-15	11	-7	-20	15	-22	-20	-15
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