

**A Backward Truckie?**

Rae Rees set some kind of record back in 1926 when he backed his 2 tonne truck for 35 kilometres. To find out the circumstances of this strange feat;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



1.

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21.

**Answer section**

A. 50°	F. 58°	L. 45°	S. 9°
B. 36°	G. 143°	N. 73°	T. 98°
C. 84°	H. 61°	O. 23°	U. 20°
D. 22°	I. 66°	P. 53°	V. 107°
E. 44°	K. 102°	R. 99°	W. 72°
			Y. 110°

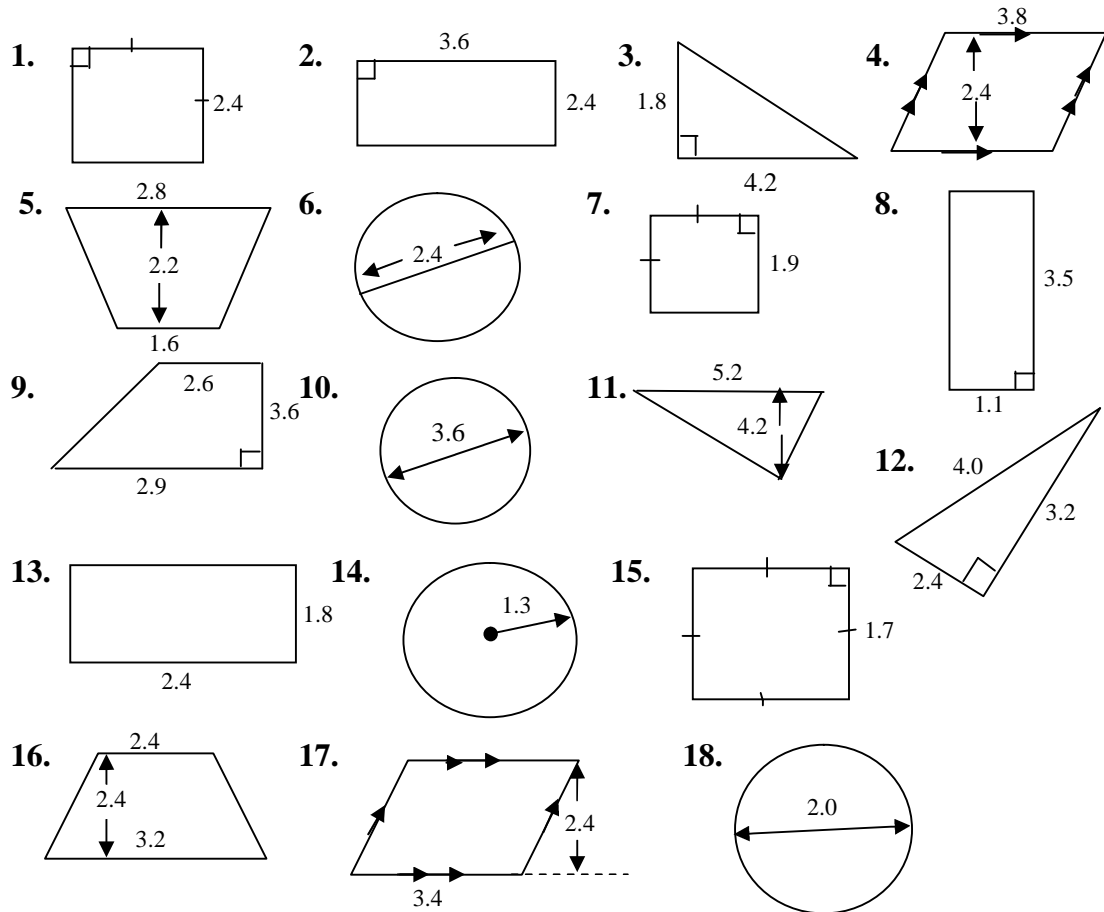
5-20 5-17-9 16-2 9-20-3-21-6-20-13 17 3-2-17-9 2-10 18-21-13-9-20-13-8  
 7-5-21-4-5 7-20-13-20 16-2-2 3-2-14-18 10-2-13 2-14-20 16-13-11-4-19,  
 8-2 16-7-2 16-13-11-4-19-8 7-20-13-20 1-2-8-21-16-21-2-14-20-9 12-17-4-19  
 16-2 12-17-4-19, 16-5-20 18-21-13-9-20-13-8 7-20-13-20 3-2-17-9-20-9  
 17-14-9 7-5-21-3-20 17 10-13-21-20-14-9 9-13-2-6-20 10-2-13-7-17-13-9-8  
 13-17-20 13-20-6-20-13-8-20-9 16-5-20 7-5-2-3-20 7-17-15.

**A Non-Swimmer's Paradise ?**

Lake Ellesmere, which is 32 kms south of Christchurch could easily be considered the safest lake in the country for swimming. To work out why;

- Find the area of each figure below.
- Locate the answer in the Answer section.
- Transfer the appropriate letter to the code at the bottom of the page.

Find the area of each figure. ( all measurements are in metres) - Take  $\pi = 3.1$



Answer section. ( All answers in sq. metres)

- |          |         |          |           |
|----------|---------|----------|-----------|
| A. 3.84  | K. 4.84 | P. 6.72  | U. 10.044 |
| D. 3.78  | L. 8.64 | R. 3.85  | V. 9.12   |
| E. 4.464 | M. 8.16 | S. 5.239 | W. 4.32   |
| I. 3.1   | N. 2.89 | T. 10.92 | Y. 3.61   |
| J. 5.76  | O. 9.9  |          |           |

12-11 18-11-14 3-6-6-16-6-14-11 16-9-18-15-11, 2-12-5-6

6-2-2-6-14-17-6-8-6 18-14 9-15-2-7 1-10-14-11 9-4-6-8 11-13-9

17-6-11-8-6-14 3-6-6-16.



Airmail

The first "airmail" in the world went into operation on the 14<sup>th</sup> May 1897 between Great Barrier Island and Auckland city. To find out more about this airmail service;

- Work out the answers to each of the problems below.
- Locate the answer in the Answer section.
- Transfer the appropriate letter to the code at the bottom of the page.



- |                  |                           |
|------------------|---------------------------|
| 1. $(-5) + (-3)$ | 11. $(-3) + (-4) - (-2)$  |
| 2. $(-5) - (-2)$ | 12. $(-6) - (-4) + 4$     |
| 3. $(-4) + 3$    | 13. $(-4) - (-4) + (-2)$  |
| 4. $(-2) - (-3)$ | 14. $(-3) + (-4) + (-2)$  |
| 5. $3 - (-6)$    | 15. $(-1) + 2 - (-4)$     |
| 6. $(-3) - (-6)$ | 16. $(-4) + (-3) + 1$     |
| 7. $5 - (-3)$    | 17. $(-4) + 4 + (-4)$     |
| 8. $6 + (-2)$    | 18. $(-3) + (-3) + 9 + 3$ |
| 9. $(-8) - 3$    | 19. $5 - 11 + (-1)$       |
| 10. $6 - (-5)$   |                           |

**Answer section**

A. -11	H. 8	N. 6	T. -5
D. -4	I. 1	O. 2	U. -3
E. 3	K. -6	P. -7	W. -1
F. 11	L. -2	R. 4	Y. -8
G. 5	M. 9	S. -9	

11-8-9-4-18-6-17    19-4-15-6-12-18-14    10-13-6-3    11-7-6    12-18-6

7-2-18-17-8-6-17    16-4-13-12-5-6-11-8-6-14    3-4-11-7    5-6-14-14-9-15-6-14

11-4-6-17    11-12    11-7-6-4-8    13-6-15-14.    9    1-6-9-8    13-9-11-6-8

11-7-4-14    19-4-15-6-12-18-15-8-9-5    3-9-14    4-14-14-2-6-17    3-4-11-7

4-11-14    12-3-18    14-11-9-5-19-14.

As is - Where is

In 1979 the Justice Department advertised for "as is - where is" buyers for a fishing boat called the *Ruptured Duck*. However there was a problem. To find out what the problem was;

- Factorise each of the expressions below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.

- |                           |                     |
|---------------------------|---------------------|
| 1. $2a + 6b$              | 11. $a^2 + a - 6$   |
| 2. $3a - 6b$              | 12. $x^2 + x - 12$  |
| 3. $9a^2 + 4a$            | 13. $x^2 - 5x - 14$ |
| 4. $6x - 3y$              | 14. $a^2 + 5a - 14$ |
| 5. $6x^2 - 3x$            | 15. $a^2 - 8a + 12$ |
| 6. $2xy - 3x$             | 16. $x^2 - 2x - 3$  |
| 7. $3x + 6y + ax + 2ay$   | 17. $a^2 - a - 6$   |
| 8. $3a^2 - 4a + 3ab - 4b$ | 18. $x^2 - 2x - 15$ |
| 9. $ax + ay + bx + by$    | 19. $x^2 - y^2$     |
| 10. $2ab - 3b - 2a + 3$   | 20. $4a^2 - 9b^2$   |

## Answer section

- |                  |                     |                 |                  |
|------------------|---------------------|-----------------|------------------|
| A. $(b-1)(2a-3)$ | F. $(x-7)(x+2)$     | N. $(a-3)(a+2)$ | T. $(3+a)(x+2y)$ |
| B. $(a+7)(a-2)$  | H. $(2a-3b)(2a+3b)$ | O. $3(2x-y)$    | U. $3(a-2b)$     |
| C. $(x+4)(x-3)$  | I. $(x-5)(x+3)$     | P. $2(a+3b)$    | W. $(a+3)(a-2)$  |
| D. $(a+b)(3a-4)$ | K. $x(2y-3)$        | R. $(a-6)(a-2)$ | X. $(x-3)(x+1)$  |
| E. $a(9a+4)$     | L. $(a+b)(x+y)$     | S. $3x(2x-1)$   | Y. $(x-y)(x+y)$  |

2-17-13-4-15-7-2-17-10-7-3-9-19    7-20-3    15-2-1-7-2-15-3-8    8-2-12-6    5-10-17-6

4-13-13    14-10-17-6-5    1-3-17-18-17-5-2-9-10    7-20-10-7    19-3-10-15    10-17-8

7-20-3    12-10-7-12-20    11-10-5    7-20-10-7    17-4-14-4-8-19    6-17-3-11

3-16-10-12-7-9-19    11-20-3-15-3    7-20-3    14-4-10-7    11-10-5.



**Downhill Birds**

All New Zealanders are familiar with the flightless kiwi, even if few have actually seen one. Two other native birds are also nearly flightless. To find out what they are and an interesting fact about them;

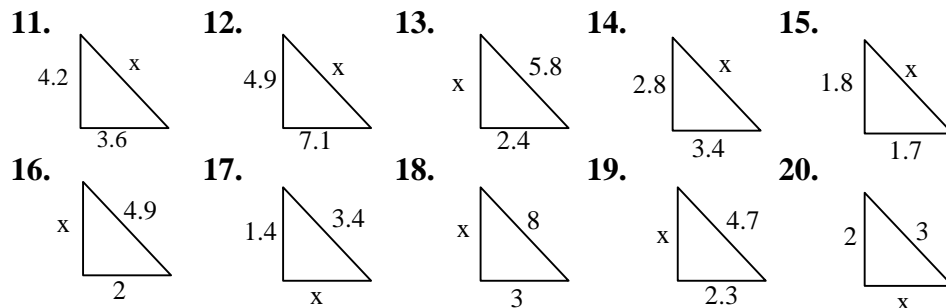
- Work out the answers to each of the problems below
- Find the answer in the answer section
- Transfer the appropriate letter to the coded section at the bottom of the page.



(Round all of your answers to 2 decimal places)

1. What is the length of the diagonal of a square with side length 3.2 cms?
2. What is the square root of 3.4 ?
3. If  $a = 2.4$ ,  $b = 5.6$  and  $c^2 = a^2 + b^2$ , find  $c$
4. A right angled triangle has a hypotenuse of length 5.6 metres and one side of length 3.4 metres. What is the length of the third side ?
5. What is the length of the longest knitting needle that will fit into a box 20cms by 8 cms by 4 cms ?
6. Find the square root of 7
7. A rectangle is 4.6 metres long and 2.8 metres wide. How long is its diagonal ?
8. If  $x = 7$ ,  $y = 9$  and  $x^2 + y^2 = z^2$ , find  $z$ .
9. What is  $\sqrt{155}$  ?
10. Find the length of the diagonal of a square of side length 6.2 cms

Find the value of  $x$  in questions 11 to 20.

**Answer Section**

- |          |         |          |         |         |
|----------|---------|----------|---------|---------|
| A. 12.45 | E. 8.63 | I. 4.40  | N. 4.47 | S. 4.10 |
| B. 5.53  | F. 5.28 | K. 11.40 | O. 2.48 | T. 7.42 |
| C. 21.91 | G. 6.09 | L. 2.65  | P. 4.45 | U. 4.53 |
| D. 5.39  | H. 8.77 | M. 3.10  | R. 1.84 | W. 2.24 |

11-15-18-10    18-10-12    12-16-7-9-16-3-12-2-12-7    8-9-8-9-4-15    9-16-7

18-10-12    8-15-8-9-8-15    5-6-14-17-11    15-2    10-15-4    1-4    18-2-12-12-19

14-16    15-2-7-12-2    18-15    3-6-14-7-12    15-16    18-10-12-14-2

14-16-12-13-13-14-5-14-12-16-18    20-14-16-3-19.

**Deer Capture**

Deer recovery by helicopter has become quite a common sight in New Zealand. However, man with all his machinery and expertise doesn't always come out on top. This was especially the case on February 14<sup>th</sup> 1978. To find out what happened on this day;

- Work out the answers to each problem below
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



If  $a = 3$ ,  $b = 2$ , and  $c = 5$ , find the value of each of the following.

- |    |                   |     |                    |     |                           |
|----|-------------------|-----|--------------------|-----|---------------------------|
| 1. | $3a^2 + b$        | 9.  | $c^2 - a(b + c)$   | 16. | $2b^2 + a^2 - 3c$         |
| 2. | $2a^2 - c$        | 10. | $2a^2 + 3b^2$      | 17. | $2(c^2 - a) - 3(b^2 + a)$ |
| 3. | $2a^2 + b^2$      | 11. | $2c^2 - a^2$       | 18. | $3a(b^2 + c)$             |
| 4. | $a^2 + b^2 + c^2$ | 12. | $3b + 2(a^2 - b)$  | 19. | $2a(a^2 + b)$             |
| 5. | $c^2 - a^2$       | 13. | $3c^2 - 2a(b + a)$ | 20. | $2a + b + c - 2b^2$       |
| 6. | $3(a - b)$        | 14. | $4c^2 - 3a^2$      | 21. | $3c^2 - b + a$            |
| 7. | $3(a^2 + b)$      | 15. | $b^2 + c^2 - 2a^2$ | 22. | $2a^2 + c^2 - 3b^2$       |
| 8. | $3a + b(a + c)$   |     |                    |     |                           |

**Answer section**

- |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| A. | 11 | H. | 4  | N. | 31 | U. | 38 |
| C. | 13 | I. | 73 | O. | 3  | V. | 30 |
| D. | 45 | J. | 23 | P. | 20 | W. | 33 |
| E. | 16 | K. | 22 | R. | 66 | Y. | 76 |
| F. | 81 | L. | 2  | S. | 5  |    |    |
| G. | 29 | M. | 25 | T. | 41 |    |    |

6-22 11-9-14-20 13-15-21, 14-22 11-9-5 16-14-22-13-14-20 12-15-20-20

15-19-5-15 15 13-5-5-19 17-4-8-12-5-13 6-22-11-6 11-9-5 20-3-14-13-20

6-18 15 9-5-16-14-2-6-12-11-5-19 15-22-13 3-14-2-3-5-13 14-11

2-15-4-20-14-22-1 14-11 11-6 18-16-14-12 6-10-5-19. 11-9-5 18-6-19-11-21

11-9-6-4-20-15-22-13 13-6-16-16-15-19 8-15-2-9-14-22-5 7-15-20 15

7-19-14-11-5 6-18-18. 11-9-5 13-5-5-19 5-20-2-15-12-5-13.

**Earthquake**

Although the Napier earthquake in 1931 was New Zealand's worst on record with over 250 people killed, it is not the strongest recorded quake we have had. To find out about a bigger quake;



- Solve each quadratic equation below.
- Locate the answer in the Answer section.
- Transfer the appropriate letter to the coded answer at the bottom of the page.

- |     |                    |     |                     |
|-----|--------------------|-----|---------------------|
| 1.  | $x^2 + x - 6 = 0$  | 13. | $x^2 - x - 6 = 0$   |
| 2.  | $x^2 - 3x + 2 = 0$ | 14. | $x^2 + 5x - 14 = 0$ |
| 3.  | $x^2 - 4x + 3 = 0$ | 15. | $x^2 - 2x - 8 = 0$  |
| 4.  | $x^2 - 1 = 0$      | 16. | $x^2 - 7x + 12 = 0$ |
| 5.  | $x^2 - x - 2 = 0$  | 17. | $x^2 - 8x + 15 = 0$ |
| 6.  | $x^2 - 2x - 3 = 0$ | 18. | $x^2 - 9x + 18 = 0$ |
| 7.  | $x^2 + 3x + 2 = 0$ | 19. | $x^2 + 7x + 12 = 0$ |
| 8.  | $x^2 + 4x + 3 = 0$ | 20. | $x^2 - x - 12 = 0$  |
| 9.  | $x^2 - 5x + 6 = 0$ | 21. | $x^2 - 3x - 18 = 0$ |
| 10. | $x^2 - 6x + 8 = 0$ | 22. | $x^2 + x - 12 = 0$  |
| 11. | $x^2 + 5x + 6 = 0$ | 23. | $x^2 + 2x - 15 = 0$ |
| 12. | $x^2 + 2x - 8 = 0$ | 24. | $x^2 + 3x - 18 = 0$ |

**Answer section**

- |    |       |    |       |    |      |    |       |
|----|-------|----|-------|----|------|----|-------|
| A. | 2,3   | G. | -3,4  | M. | 3,4  | T. | -2,4  |
| B. | -3,-4 | H. | -1,1  | N. | 1,2  | U. | 2,-7  |
| C. | 3,5   | I. | -2,-3 | O. | -1,3 | V. | -1,-2 |
| D. | 3,-6  | J. | -3,2  | Q. | 2,-4 | W. | 3,-4  |
| E. | 3,-5  | K. | -1,-3 | R. | 3,6  | Y. | 2,4   |
| F. | -2,3  | L. | -1,2  | S. | 1,3  | Z. | -3,6  |

15-4-23 19-11-20-20-23-3-15 2-23-22 21-23-9-5-9-2-24

23-9-18-15-4-12-14-9-8-23 11-2 4-11-3-15-6-18-11-17-9-5 15-11-16-23-3

22-9-3 15-4-23 22-23-5-5-11-2-20-15-6-2 23-9-18-15-4-12-14-9-8-23 11-2

1-9-2-14-9-18-10 23-11-20-4-15-23-23-2 13-11-13-15-10 13-11-7-23 22-11-15-4

9 16-9-20-2-11-15-14-24-23 6-13 9-19-6-14-15 23-11-20-4-15 6-2 15-4-23

18-11-17-4-15-23-18 3-17-9-5-23.

**Famous First**

There have been many famous firsts in new Zealand. Timothy O'Meara of Wellington would probably rather forget his. To find out why;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



- |                        |                                    |
|------------------------|------------------------------------|
| 1. $(-2) \times (-5)$  | 12. $(-4)^2$                       |
| 2. $(+3) \times (-4)$  | 13. $(-2)^3$                       |
| 3. $(-12) \div (-2)$   | 14. $(-2) \times (+3) \times (-4)$ |
| 4. $(+4) \div (-1)$    | 15. $(-6) \div (-2) \div (+3)$     |
| 5. $(-5) \times (-6)$  | 16. $(+5) \times (-2) \times (+3)$ |
| 6. $(+5) \times (-3)$  | 17. $(-6) \times (-4) \times (-2)$ |
| 7. $(-12) \div (+4)$   | 18. $(+48) \div (-4) \div (-3)$    |
| 8. $(-20) \div (-4)$   | 19. $(+3) \times (-6) \div (-9)$   |
| 9. $(+30) \div (-6)$   | 20. $(-8) \times (-3) \div (-12)$  |
| 10. $(+6) \times (-4)$ | 21. $(-2)^2 \times (-4)$           |
| 11. $(-3) \times (+6)$ | 22. $(-2)^3 \div (-4) \times (-3)$ |

**Answer section**

- |        |       |        |        |
|--------|-------|--------|--------|
| A. -5  | G. 1  | P. -16 | V. -48 |
| B. 30  | H. -8 | Q. 10  | W. 4   |
| C. -3  | I. 5  | R. 6   | Y. -4  |
| D. -12 | L. 2  | S. -2  | Z. -30 |
| E. 16  | N. 24 | T. -24 |        |
| F. -18 | O. -6 | U. -15 |        |

8-14 12-8-15-13-10-12-12-14 11-22-3-10-4 11-8-17-12 13-12  
 18-9-20 3-12-20-21-22-14-20-8-5-19-12 11-22-3 10-13-12  
 12-9-3-19-8-12-20-10 3-12-7-22-3-2-12-2 11-22-3-15-12-3-4  
 22-11 9 14-12-18 16-12-9-19-9-14-2 14-22-10-12, (11-8-17-12  
 21-22-6-14-2). 13-12 18-9-20 20-6-5-20-12-1-6-12-14-10-19-4  
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 21-3-8-20-22-14.

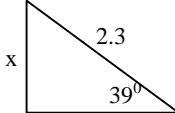
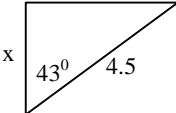
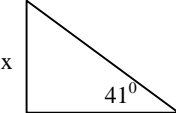
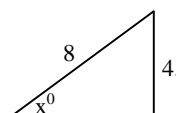
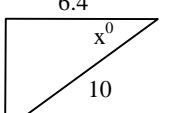
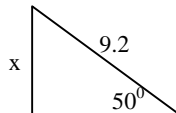
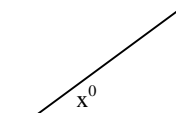
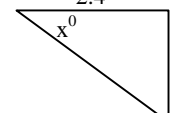
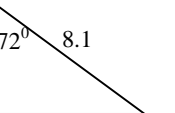
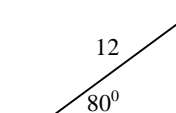
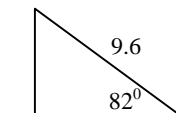
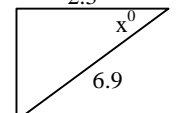
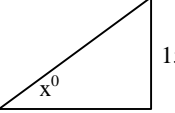
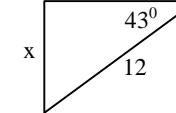
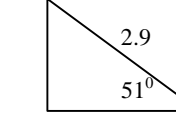
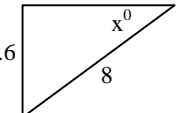
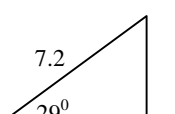
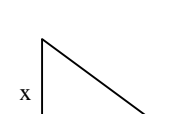
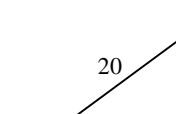


**Hairy Sheep.**

The Drysdale, named after Dr F.W.Dry of Massey University, is prized for the hairs which are present in its fleece. Dr Dry isolated the relevant genetic factor for the hair. To find out more about the Drysdale and why its fleece is highly prized;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



1. 	2. 	3. 	4. 
5. 	6. 	7. 	8. 
9. 	10. 	11. 	12. 
13. 	14. 	15. 	16. 
17. 	18. 	19. 	

**Answer section.**

( Note - All answers have been rounded to 3dp for lengths and 1dp for angles)

- |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| A. 6.297             | E. 3.291             | L. 21.8 <sup>0</sup> | P. 1.447             | U. 26.7 <sup>0</sup> |
| B. 7.048             | F. 1.825             | M. 50.2 <sup>0</sup> | R. 2.503             | V. 8.184             |
| C. 51.3 <sup>0</sup> | H. 8.659             | N. 3.129             | S. 36.9 <sup>0</sup> | W. 1.336             |
| D. 11.818            | I. 41.4 <sup>0</sup> | O. 70.5 <sup>0</sup> | T. 63.4 <sup>0</sup> |                      |

19-8 19-4 6-2-7-19-2-14-2-10 8-18-17-8 18-2 19-3-8-2-3-10-2-10 8-12  
 6-9-2-2-10 19-8 12-16-8. 19-3-4-8-2-17-10 18-2 10-2-14-2-7-12-1-2-10 17  
 3-2-11 6-9-2-2-10 11-18-19-13-18 6-2-13-17-5-2 14-17-7-16-17-6-7-2 15-12-9  
 13-17-9-1-2-8 11-12-12-7.

**Garston**

The small South Island town of Garston, which lies about 11 kms South of Lake Wakatipu has an unusual distinction. To find out what it is;

- Find the images of the points below under the given transformations
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



**Note:** It may help if you draw a set of axes and mark the points.

In this exercise;  $R_{180}$  → a half turn about the origin  
 $R_{90}$  → a quarter turn (anticlockwise) about the origin  
 $M_x$  → a reflection in the X axis  
 $M_y$  → a reflection in the Y axis and  
 $E$  → an enlargement of scale factor 2

- |                                     |  |
|-------------------------------------|--|
| 1. (3,4) under $M_x$                | 12. (5,0) under $E$ , centre (4,1)     |
| 2. (5,2) under $M_y$                | 13. (-5,-5) under $M_x$                |
| 3. (-2,2) under $R_{180}$           | 14. (-4,8) under $M_y$                 |
| 4. (-4,2) under $R_{90}$            | 15. (7,-6) under $R_{180}$             |
| 5. (-5,-1) under $M_x$              | 16. (-5,-1) under $E$ , centre (-6,-3) |
| 6. (3,0) under $E$ , centre (0,0)   | 17. (5,2) under $E$ , centre (3,0)     |
| 7. (-1,-1) under $M_y$              | 18. (5,0) under $M_x$                  |
| 8. (4,-3) under $E$ , centre (6,-3) | 19. (4,-3) under $M_y$                 |
| 9. (7,-3) under $R_{90}$            | 20. (3,0) under $R_{90}$               |
| 10. (5,2) under $R_{180}$           | 21. (3,4) under $E$ , centre (0,0)     |
| 11. (-5,-1) under $M_y$             | 22. (5,2) under $R_{90}$               |

**Answer section.**

- |           |           |            |            |
|-----------|-----------|------------|------------|
| A. (5,0)  | G. (3,7)  | N. (2,-2)  | T. (-2,5)  |
| B. (4,8)  | H. (6,8)  | O. (-5,2)  | U. (-4,-3) |
| C. (5,-1) | I. (6,0)  | P. (-5,-2) | W. (6,-1)  |
| D. (-7,6) | K. (2,-4) | R. (7,4)   | Y. (-5,1)  |
| E. (2,-3) | L. (3,-4) | S. (-5,5)  | Z. (-4,1)  |
| F. (0,3)  | M. (1,-1) |            |            |

3-2 10-18-17-22 2-20 3-8-12 16-8-18-1-18-3-15 6-13 7-2-17-8 22-21-18-3

2-3-8 21-19-3-15-17-8-15 18-3-15 22-12-8-3-22-5 8-6-9-21-22 4-7-13 20-17-2-7

22-21-8 13-8-18. 9-18-17-13-22-2-3 21-18-13 22-21-8 15-6-13-22-6-3-11-22-6-2-3

2-20 14-8-6-3-9 22-21-8 20-19-17-22-21-8-13-22 13-8-22-22-1-8-7-8-3-22 20-17-2-7

13-18-1-22 12-18-22-8-17 6-3 22-21-8 11-2-19-3-22-17-5.

**Kaiwhare, the taniwha of the Manukau Harbour, is sometimes recorded as inoffensive and sometimes as a noxious, spiteful creature, who terrified the local people with his misdeeds. To find out how the taniwha was given his name;**

- Work out the answer to each problem below.
- Locate the answer in the Answer section.
- Transfer the appropriate letter to the coded answer at the bottom of the page.



- |                   |                    |                    |                    |
|-------------------|--------------------|--------------------|--------------------|
| 1. $87 \times 56$ | 7. $71 \times 83$  | 13. $28 \times 43$ | 19. $63 \times 54$ |
| 2. $42 \times 39$ | 8. $62 \times 49$  | 14. $69 \times 17$ | 20. $81 \times 85$ |
| 3. $27 \times 83$ | 9. $32 \times 36$  | 15. $48 \times 22$ | 21. $77 \times 53$ |
| 4. $64 \times 17$ | 10. $41 \times 42$ | 16. $53 \times 27$ | 22. $68 \times 49$ |
| 5. $81 \times 54$ | 11. $61 \times 37$ | 17. $63 \times 33$ | 23. $57 \times 38$ |
| 6. $43 \times 62$ | 12. $42 \times 37$ | 18. $43 \times 72$ |                    |

**Answer section**

- |         |         |         |         |
|---------|---------|---------|---------|
| A. 2257 | G. 2666 | N. 3332 | U. 1722 |
| B. 1152 | H. 4374 | O. 1638 | V. 2166 |
| C. 1554 | I. 4081 | P. 1204 | W. 5893 |
| D. 2079 | K. 1173 | R. 2241 | X. 3402 |
| E. 3096 | L. 1431 | S. 6885 | Y. 4872 |
| F. 3038 | M. 1088 | T. 1056 |         |

8-21-20-5-18-3-4-18-22    7-2-10-16-17    22-2-15    17-11-3-18    18-4-9-11-3-14

2-22    11-22    18-19-13-18-17-21-15-21-2-22    7-21-15-5-2-10-15    20-18-22-17-21-22-6

11-22    2-8-8-18-3-21-22-6    15-2    14-11-21-7-5-11-3-18.    15-5-21-20

2-8-8-18-3-21-22-6    12-2-22-20-21-20-15-18-17    2-8    8-2-2-17    7-5-21-12-5

7-11-20    13-16-11-12-18-17    21-22    11    4-21-22-21-11-15-10-3-18    5-2-10-20-18

9-10-21-16-15    2-22    11    20-4-11-16-16    3-11-8-15    11-22-17    20-18-15

11-17-3-21-8-15    2-22    15-5-18    18-9-9    15-21-17-18.    21-15    7-11-20

11    6-2-2-17    2-4-18-22    11-22-17    8-21-20-5    7-2-10-16-17    9-18

13-16-18-22-15-21-8-10-16    21-8    15-5-18-3-18    7-11-20    22-2    20-21-6-22    2-8

15-5-18    3-11-8-15    22-18-19-15    4-2-3-22-21-22-6,    8-2-3    21-15

20-5-2-7-18-17    15-5-11-15    14-11-21-7-5-11-3-18    7-11-20    20-11-15-21-20-8-21-18-17

7-21-15-5    15-5-18    2-8-8-18-3-21-22-6.    8-3-2-4    15-5-21-20    12-18-3-18-4-2-22-1

14-11-21-7-5-11-3-18,    15-5-18    5-2-10-20-18    18-11-15-18-3,    3-18-12-18-21-23-18-17

5-21-20    22-11-4-18.

**Long-winded**

Arthur Beauchamp, a member of the Marlborough Provincial Council in the days when New Zealand was divided into six self-governing provinces, won the reputation as the nations most long-winded speaker. In a speech concerning whether or not Picton should remain the Provincial Capital and after ten and a half hours on his feet he declared .....

To find out just what he had to add;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



Write in Standard form

- |    |        |    |      |    |         |    |              |
|----|--------|----|------|----|---------|----|--------------|
| 1. | 34 500 | 2. | 34.5 | 3. | 0.00345 | 4. | 345          |
| 5. | 0.345  | 6. | 3.45 | 7. | 345 000 | 8. | 3.45 million |

Write as ordinary numbers

- |     |                       |     |                    |     |                       |     |                       |
|-----|-----------------------|-----|--------------------|-----|-----------------------|-----|-----------------------|
| 9.  | $2.78 \times 10^5$    | 10. | $2.78 \times 10^3$ | 11. | $2.78 \times 10^{-2}$ | 12. | $2.78 \times 10^0$    |
| 13. | $2.78 \times 10^{-1}$ | 14. | $2.78 \times 10^1$ | 15. | $2.78 \times 10^6$    | 16. | $2.78 \times 10^{-3}$ |

Round each of the numbers below to the given degree of accuracy.

- |     |                |     |                      |     |                     |
|-----|----------------|-----|----------------------|-----|---------------------|
| 17. | 23.567 to 2 dp | 18. | 2.3567 to 3 sig figs | 19. | 23.567 to 1 sig fig |
| 20. | 235.67 to 1 dp | 21. | 23567 to 2 sig figs  | 22. | 2.3567 to 3 dp      |

Answer section.

- |    |                    |    |                       |    |                    |    |                    |
|----|--------------------|----|-----------------------|----|--------------------|----|--------------------|
| A. | 2.36               | H. | 278 000               | N. | 2.78               | T. | 27.8               |
| B. | $3.45 \times 10^0$ | I. | 235.7                 | O. | $3.45 \times 10^1$ | U. | $3.45 \times 10^6$ |
| C. | 0.0278             | J. | $3.45 \times 10^4$    | P. | 0.278              | V. | 0.00278            |
| D. | 24 000             | K. | 20                    | R. | $3.45 \times 10^2$ | W. | $3.45 \times 10^5$ |
| E. | 2.357              | L. | $3.45 \times 10^{-1}$ | S. | 23.57              | Y. | 2 780 000          |
| F. | 2 780              | M. | $3.45 \times 10^{-3}$ |    |                    |    |                    |

" 18-10-14-22-4 14-9-22-17-22 10-22-7 13-4-22-5-20-3-20-12-18-4-15

4-22-3-18-4-19-17 20 7-20-5-5 12-2-7 13-4-2-11-22-22-21 14-2 17-13-22-18-19

2-12 14-9-22 17-8-6-1-22-11-14 8-12-21-22-4 21-20-17-11-8-17-17-20-2-12. "

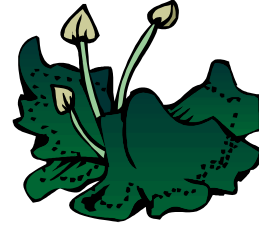
6-8-14 9-20-17 16-2-20-11-22 10-18-20-5-22-21 9-20-3 18-12-21 9-22

11-2-5-5-18-13-17-22-21 18-10-14-22-4 12-22-18-4-5-15 22-5-22-16-22-12 9-2-8-4-17.

## Mosses

New Zealand can lay claim to having both the largest and the smallest mosses in the world. The largest has the scientific name "DAWSONIA SUPERBA" which can grow to a height of 76 cms. To find out about the smallest moss in the world;

- Work out the answer to each of the problems below.
- Find the answers in the Answer section.
- Transfer the appropriate letter to the coded answer at the bottom of the page.



- |     |                              |     |                              |
|-----|------------------------------|-----|------------------------------|
| 1.  | $4x + 3y + x - 2x$           | 11. | $5y + 4x - y - 5x + 3x$      |
| 2.  | $x + 2x + 3y + 2x - 2y$      | 12. | $5x + x + y - x + 2y - y$    |
| 3.  | $2x + 3y + 3x + 2y - 4x - y$ | 13. | $x + 5x + 3y - 2x - 2y - 2x$ |
| 4.  | $x + y + x + y + x - y$      | 14. | $3x + 4y + x - 2y - x + 2y$  |
| 5.  | $2x + 2y + 3x - y - 4x$      | 15. | $x + x + 2x + 2y - 3x + y$   |
| 6.  | $5x + 2x + 4y - 6x - 2y$     | 16. | $3x + 2y + 2x - y - x$       |
| 7.  | $x + 3y + 2x + y + x - 2y$   | 17. | $7x + y - 2x + 3x + 3y - 4x$ |
| 8.  | $3x + 3x + 4y - x - y$       | 18. | $x + 2x + 2y - y + x + 2y$   |
| 9.  | $x + y + 2x + y - x$         | 19. | $3x + 2y - 2x + x + y$       |
| 10. | $4x - x + y + y$             |     |                              |

### Answer section.

- |    |           |    |           |    |           |    |           |
|----|-----------|----|-----------|----|-----------|----|-----------|
| A. | $2x + 2y$ | G. | $2x + 3y$ | N. | $x + 2y$  | T. | $x + y$   |
| C. | $x + 3y$  | H. | $2x + y$  | O. | $4x + y$  | U. | $4x + 3y$ |
| D. | $3x + 3y$ | I. | $4x + 2y$ | P. | $3x + y$  | W. | $4x + 4y$ |
| E. | $x + 4y$  | L. | $3x + 4y$ | R. | $5x + 3y$ | Y. | $2x + 4y$ |
| F. | $3x + 2y$ | M. | $5x + y$  | S. | $5x + 2y$ |    |           |

5 - 13 - 3    12 - 2 - 9 - 14 - 14 - 3 - 12 - 5    2 - 16 - 12 - 12    7 - 12

4 - 13 - 9 - 12 - 15 - 18 - 2    9 - 4 - 7 - 15 - 18 - 14 - 9 - 5 - 18 - 2

17 - 13 - 7 - 15 - 13    17 - 13 - 3 - 6    10 - 18 - 14 - 14 - 11    19 - 8 - 16 - 17 - 6

7 - 12    12 - 2 - 9 - 14 - 14 - 3 - 8    5 - 13 - 9 - 6    9    19 - 8 - 9 - 7 - 6

16 - 10    2 - 18 - 12 - 5 - 9 - 8 - 1    12 - 3 - 3 - 1.

## Mount Cook

Mount Cook not only lays claim to being the highest mountain in New Zealand at 3764 metres, but it also holds another dubious record. To find out what this record is;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.

- |     |                      |     |                       |
|-----|----------------------|-----|-----------------------|
| 1.  | $2.34 + 4.56 + 0.21$ | 12. | $5.32 - 4.85$         |
| 2.  | $93.47 - 47.2$       | 13. | $27.4 \times 3.6$     |
| 3.  | $4.62 \times 5.4$    | 14. | $4.2 \times 8.7$      |
| 4.  | $27.45 \div 9$       | 15. | $61.4 \times 3$       |
| 5.  | $32.4 + 4 + 0.63$    | 16. | $4.35 \times 0.8$     |
| 6.  | $48.2 + 3.71 + 23$   | 17. | $34.21 \div 11$       |
| 7.  | $51.64 + 2.4 + 0.32$ | 18. | $109.2 \div 7$        |
| 8.  | $4.17 + 2.3 + 3.61$  | 19. | $68.24 \div 8$        |
| 9.  | $87.34 - 49.56$      | 20. | $21.42 \div 7$        |
| 10. | $54.21 - 8.37$       | 21. | $4.23 + 6.42 - 3.85$  |
| 11. | $124.2 - 83.64$      | 22. | $14.2 + 2.31 - 12.79$ |

## Answer Section

- |    |       |    |       |    |        |
|----|-------|----|-------|----|--------|
| A. | 37.78 | I. | 3.06  | R. | 24.948 |
| B. | 0.47  | K. | 7.11  | S. | 3.11   |
| C. | 54.36 | L. | 3.48  | T. | 74.91  |
| D. | 15.6  | M. | 36.54 | U. | 8.53   |
| E. | 184.2 | N. | 40.56 | V. | 37.03  |
| F. | 10.08 | O. | 6.8   | X. | 46.27  |
| G. | 3.05  | P. | 45.84 | Y. | 98.64  |
| H. | 3.72  |    |       |    |        |

11-21-6 21-11-16-13 20-17 20-6 6-22-15 22-20-4-22-15-17-6,

12-19-6 20-6 20-17 9-16-17-21 6-22-15 14-21-17-6

18-9-11-4-15-3-21-19-17. 21-5-15-3 21-11-15 22-19-11-18-3-15-18

9-11-18 17-20-2-6-13 10-15-21-10-16-15 22-9-5-15 16-21-17-6

6-22-15-20-3 16-20-5-15-17 20-11 6-22-15 14-6 7-21-21-1

3-15-4-20-21-11 17-20-11-7-15 6-22-15 6-19-3-11 21-8 16-9-17-6

7-15-11-6-19-3-13.



**New Zealand's First Jail.**

The first place of detention in NZ was at Kororareka, now known as Russell. The residents formed a vigilante group and to restrain their captives they built a "jail" of sorts. To find out about this early jail;

- Work out the answers to each of the problems below.
- Locate the answer in the Answer section.
- Transfer the appropriate letter to the code at the bottom of the page.



- |    |                 |     |                |     |                 |
|----|-----------------|-----|----------------|-----|-----------------|
| 1. | 87.34 - 29.46   | 9.  | 65.4 - 37.91   | 17. | 34.6 - 17.21    |
| 2. | 429.3 - 87.94   | 10. | 3.85 - 0.98    | 18. | 423.86 - 275.95 |
| 3. | 212.61 - 42.35  | 11. | 612.43 - 425.7 | 19. | 384.23 - 297.68 |
| 4. | 72.48 - 19.4    | 12. | 326.1 - 57.42  | 20. | 43.7 - 18.92    |
| 5. | 3.14 - 1.67     | 13. | 912.5 - 737.42 | 21. | 61.5 - 8.93     |
| 6. | 5.87 - 3.92     | 14. | 61.8 - 39.9    | 22. | 204 - 37.16     |
| 7. | 59.37 - 6.14    | 15. | 48.34 - 27.36  | 23. | 318 - 237.14    |
| 8. | 512.31 - 387.29 | 16. | 21.58 - 17.9   |     |                 |

**Answer section**

- |    |        |    |       |    |        |    |        |
|----|--------|----|-------|----|--------|----|--------|
| A. | 86.55  | G. | 80.86 | M. | 1.95   | T. | 175.08 |
| B. | 341.36 | H. | 27.49 | N. | 186.73 | U. | 52.57  |
| C. | 20.98  | I. | 24.78 | O. | 268.68 | V. | 2.87   |
| D. | 53.23  | J. | 17.39 | P. | 166.84 | W. | 147.91 |
| E. | 1.47   | K. | 57.88 | R. | 53.08  | Y. | 3.68   |
| F. | 170.26 | L. | 21.9  | S. | 125.02 |    |        |

13-9-5   3-20-4-8-13   17-19-20-14   18-19-8   19-11   12-14-7   8-5-19

15-9-5-8-13   10-5-11-13-20-14-19-13-5-7   12-11-14-16   2-16   23-20-6-14-5-13

9-12-14-5-8.   13-9-5   3-20-4-8-13   17-19-20-14   5-8-22-5-15-20-19-14-14-16

2-21-20-14-13   3-12-4   13-9-19-13   22-21-4-22-12-8-5,   18-19-8   12-22-5-11-5-7

20-11   5-20-23-9-13-5-5-11   3-12-4-13-16   13-9-4-5-5   20-11   2-21-15-1-14-5

8-13-4-5-5-13   18-5-14-14-20-11-23-13-12-11.

**Strange Export**

Planners once seriously considered exporting a rather strange product from the Chatam Islands to the mainland of New Zealand. To find out what the strange item was and a why the planners were considering it;

- Work out the answer to each problem below.
- Locate the answer in the Answer section
- Transfer the appropriate letter to the code at the bottom of the page.



- |    |                             |     |                                  |     |                                  |
|----|-----------------------------|-----|----------------------------------|-----|----------------------------------|
| 1. | $\frac{1}{2} + \frac{1}{3}$ | 9.  | $\frac{3}{8} - \frac{1}{3}$      | 17. | $\frac{6}{7} \times \frac{1}{3}$ |
| 2. | $\frac{2}{5} + \frac{1}{4}$ | 10. | $\frac{6}{7} - \frac{1}{8}$      | 18. | $\frac{3}{4} \times \frac{2}{3}$ |
| 3. | $\frac{3}{4} + \frac{1}{7}$ | 11. | $\frac{2}{3} - \frac{3}{8}$      | 19. | $\frac{8}{11} \div \frac{4}{5}$  |
| 4. | $\frac{2}{5} + \frac{1}{8}$ | 12. | $\frac{7}{12} - \frac{2}{5}$     | 20. | $\frac{2}{7} \div \frac{4}{5}$   |
| 5. | $\frac{3}{5} + \frac{1}{4}$ | 13. | $\frac{1}{2} \times \frac{3}{4}$ | 21. | $\frac{7}{12} \div \frac{3}{4}$  |
| 6. | $\frac{1}{7} + \frac{3}{8}$ | 14. | $\frac{2}{3} \times \frac{3}{5}$ | 22. | $\frac{2}{5} \div \frac{1}{2}$   |
| 7. | $\frac{3}{4} - \frac{1}{5}$ | 15. | $\frac{4}{9} \times \frac{3}{8}$ | 23. | $\frac{3}{4} \div \frac{7}{8}$   |
| 8. | $\frac{2}{3} - \frac{3}{5}$ | 16. | $\frac{3}{7} \times \frac{4}{5}$ |     |                                  |

**Answer section.**

- |    |                 |    |                 |    |                 |    |                 |    |                 |    |                 |
|----|-----------------|----|-----------------|----|-----------------|----|-----------------|----|-----------------|----|-----------------|
| A. | $\frac{29}{56}$ | E. | $\frac{11}{60}$ | I. | $\frac{1}{6}$   | N. | $\frac{1}{15}$  | S. | $\frac{17}{20}$ | W. | $\frac{25}{28}$ |
| B. | $\frac{7}{24}$  | F. | $\frac{11}{20}$ | K. | $\frac{12}{35}$ | O. | $\frac{10}{11}$ | T. | $\frac{21}{40}$ | Y. | $\frac{6}{7}$   |
| C. | $\frac{5}{6}$   | G. | $\frac{1}{2}$   | L. | $\frac{7}{9}$   | P. | $\frac{2}{7}$   | U. | $\frac{3}{8}$   | Z. | $\frac{1}{24}$  |
| D. | $\frac{13}{20}$ | H. | $\frac{4}{5}$   | M. | $\frac{41}{56}$ | R. | $\frac{5}{14}$  | V. | $\frac{2}{5}$   |    |                 |

11-12-21-15-12-14-12    15-4    19-20    8-19-4    15-4    3-6-5    7-20-19-9-12-8

3-12-16-6    10-12-6-4.    4-22-12    1-22-6-4-6-10-5    6-20-12    4-22-12    19-8-21-23

20-12-18-15-19-8    15-8    8-12-3    9-12-6-21-6-8-2    3-22-12-20-12    15-4    15-5

17-12-20-10-15-4-4-12-2    4-19    22-13-8-4    4-22-12-10.















