MATHEMATICS

* LEVEL 4 *

STRAND ASSESSMENT SHEETS

Number

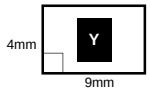
15. Find each percentage of these numbers.

10% of $39.80 = ____

25% of $48.20 = ____

Measurement

20. Calculate the area of shape Y.



Area of Y = ____

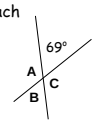
Geometry

29. Calculate the size of each missing angle.

∠A = _____

∠B = _____

∠C = _____



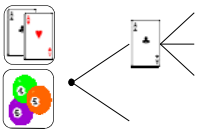
Algebra

38. Solve each equation.

2a = 38	a = _____
9b = 54	b = _____
3c + 9 = 33	c = _____
5d - 8 = 22	d = _____

Statistics

45. Complete this tree diagram.



This resource is one of a series of **5 resources** covering the

FIVE STRANDS OF ACHIEVEMENT OBJECTIVES

for Levels 1 to 5 of

Mathematics in the New Zealand Curriculum

also included ...

NUMERACY ASSESSMENT SHEETS

... to help develop and enhance student's skill level in the basic numeracy facts

Addition

Adding 3 digit numbers - with and without carrying

342	192	279	894
+ 531	+ 123	+ 391	+ 121
____	____	____	____

Subtraction

Subtracting 3 digit numbers - with and without renaming

398	605	222	600
- 514	- 410	- 193	- 181
____	____	____	____

Multiplication

Multiplying - mixed

8 x 6 = ____ 3 x 8 = ____

10 x 7 = ____ 9 x 4 = ____

Division

Dividing - mixed

24 ÷ 6 = ____ 32 ÷ 8 = ____

21 ÷ 7 = ____ 45 ÷ 9 = ____

Author: A. W. Stark

AWS Publications Ltd

MATHEMATICS
* LEVEL 4 *
STRAND ASSESSMENT SHEETS

MEASUREMENT

NUMBER **GEOMETRY**

This resource is one of a series of **5 resources** covering the

FIVE STRANDS OF ACHIEVEMENT OBJECTIVES

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ALGEBRA **STATISTICS**

also included ....

NUMERACY ASSESSMENT SHEETS

... to help develop and enhance student's skill level of the basic numeracy facts

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MS4

Author: A. W. Stark

First Published November 2003

Formatting and Publishing by
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Note from the author:

This resource ...

*Mathematics Strand Assessment Sheets - Level 4

is one of a series of **FIVE** resources written utilising the achievement objectives as stated in

Mathematics in the New Zealand Curriculum.

These resources have been designed to assist you to determine the mathematical ability of a pupil at the beginning of a year and then reassess later in the year to measure the 'value added'.

There are TWO types of assessments offered. One covers the four basic **Numeracy Facts** appropriate for each level. The second assessment covers **ALL five strands** from within ONE level of the curriculum. There are **2 parallel assessments** prepared for each type of assessment. This gives the opportunity to pre-test and post-test pupils.

The data you collect about each pupil or the class can be used in several ways, such as deciding on grouping arrangements within the class, highlighting areas of concern or strength for each pupil and helping you to decide on the teaching programme for a term or part of the year. **Pupil Record Sheets** are included which can be used to record results and note the 'value added' for each pupil.

This series of resources has been written with you in mind. I am sure you will find this resource easy to use and of benefit to you and your students.

Andrew Stark

Resources in this series:

Mathematics Strand Assessments written utilising the objectives as stated in ***Mathematics in the New Zealand Curriculum for Level 1***	Resource Code: **MS1**
Mathematics Strand Assessments written utilising the objectives as stated in ***Mathematics in the New Zealand Curriculum for Level 2***	Resource Code: **MS2**
Mathematics Strand Assessments written utilising the objectives as stated in ***Mathematics in the New Zealand Curriculum for Level 3***	Resource Code: **MS3**
Mathematics Strand Assessments** written utilising the objectives as stated in ***Mathematics in the New Zealand Curriculum for Level 4	Resource Code: **MS4**
Mathematics Strand Assessments written utilising the objectives as stated in ***Mathematics in the New Zealand Curriculum for Level 5***	Resource Code: **MS5**

Complementary Resources:

Mathematics Multi-Level Assessments - Levels 1 to 5

A series of **THREE** resources covering each strand of the curriculum across 3 levels in ONE assessment.

Resource Codes: **ML1** (Levels 1/2/3), **ML2** (Levels 2/3/4), **ML3** (Levels 3/4/5)

For more information about these and other resources, please contact ...

AWS Publications Ltd

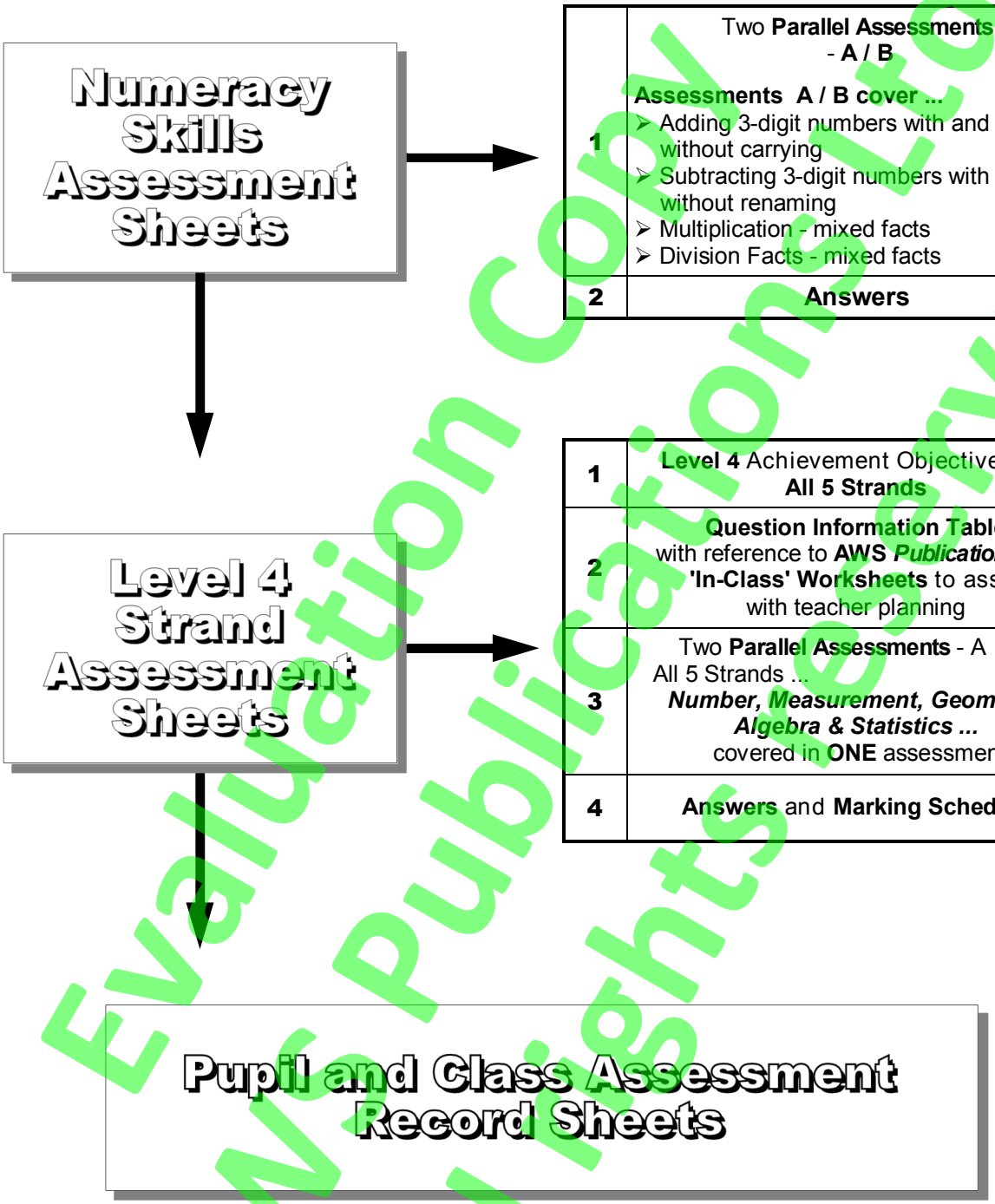
☎ (03) 338 0516 (03) 338 0514

Acknowledgement:

I would like to thank the staff and pupils of **Medbury Primary, Christchurch** for their assistance in making these resources possible.

How to find your way around this resource:

The flow-chart below shows the printing order and content of this resource.



I wish you well, using this resource.

Andrew Stark

Numeracy Assessments

This section contains the following information ....

Assessment and Marking Ideas

Why Assess?

The main purpose of a school-based assessment is to improve learning, the quality of learning programmes and to be used for reporting progress and providing summative information.

With any Assessment Activity, it is important that the purpose of the assessment is clearly stated to the pupils and that pupils receive feedback. Constructive feedback encourages pupils and helps to increase their confidence.

There are two important aspects to learning the Numeracy facts - **accuracy** and **speed**.

With initial assessment tasks, such as pre-tests, pupils should be given adequate time to complete the assessment task. In this way you will be testing what they actually know, rather than limiting their results due to lack of time. As pupil's confidence and knowledge of the numeracy facts increases, a time limit can be placed on an assessment task. The objective is for pupils to answer all questions correctly in the shortest possible time.

Example: A pupil takes 5 minutes to answer all questions but makes 5 mistakes. The next time the pupil attempts the assessment, their aim might be to complete the task within 5 minutes, with 100% accuracy. Once this is achieved, their aim might be to complete the same task within 4 minutes with 100% accuracy. Pupils can determine their own goals.

The **Numeracy Skills Assessment Sheets** have been included to enable you to assess a pupil's numeracy skill level. The development and improvement of a pupil's numeracy skill level can be enhanced by using either of the following **AWS Publications Ltd** resources which provide an on-going maintenance programme.

A Complete Guide to Numeracy series

Each Numeracy resource includes ...

- 150 Basic Facts Activities, plus 30 Bonus Activities for Numeracy Books NSB2 to NSB7
- Pupil & Teacher Record Sheets / Reporting & Assessment Sheets
- Merit & Certificate of Achievement Masters plus ANSWERS for Books NSB2 to NSB7

Code	Year
NSB1	1/2
NSB2	3
NSB3	4
NSB4	5
NSB5	6
NSB6	7
NSB7	8

Daily Number Revision Series

Each Daily Number Revision resource includes ...

- 150 Daily Activity Tasks covering the FOUR Numeracy Skills, *plus* a Number Strand Achievement Objective
- FOUR Parallel Assessment Sheets, *plus* ANSWERS for Books L2N1 to L4N2
- Pupil & Teacher Record Sheets

Code	Year
L1N1	1/2
L2N1	3
L2N2	4
L3N1	5
L3N2	6
L4N1	7
L4N2	8

The **degree of accuracy** required is shown in the table below and is also noted on the bottom of each assessment sheet.

Descriptors	Degree of Accuracy Achieved	*Example:*
S = Shows Strength	100% accuracy	80 out of 80
A = Achieved	80% - 99% accuracy	64 to 79 out of 80
D = Developing	less than 80% accuracy	less than 64 out of 80

The **degree of accuracy** required may seem high, but if ALL pupils know what standard is expected, they have something to aim for. Remember to allow enough time for pupils to complete each assessment task, so you are assessing what they know, before increasing the challenge by decreasing the amount of time allowed for the assessment.

The aim is for pupils to be able to **recall the basic numeracy facts** with **accuracy** and then later on with **accuracy** and **speed**. Pupils should be given an opportunity to redo any assessment to improve their score and as part of a maintenance programme, several times if necessary.

The **descriptors** listed in the box are used to describe the mastery level the pupil is working at and these results can be recorded on the **Pupil Progress Record Sheet**. On these sheets you can either record the actual score or one of the descriptor letters **S**, **A** or **D**.

Answers are included.

Numeracy Skills Assessment - L4

A

Name: _____ School: _____ Class: _____ Date: _____

A: Adding 3-digit numbers - no carrying

(1) 143 + 706 = ____ (2) 704 + 252 = ____ (3) 326 + 302 = ____ (4) 158 + 330 = ____ (5) 411 + 158 = ____

(6) 104 + 173 = ____ (7) 291 + 307 = ____ (8) 263 + 215 = ____ (9) 462 + 401 = ____ (10) 206 + 532 = ____

B: Adding 3-digit numbers - carrying

(11) 796 + 564 = ____ (12) 947 + 579 = ____ (13) 691 + 889 = ____ (14) 678 + 783 = ____ (15) 957 + 359 = ____

(16) 786 + 795 = ____ (17) 867 + 268 = ____ (18) 278 + 985 = ____ (19) 984 + 688 = ____ (20) 993 + 497 = ____

C: Subtracting 3-digit numbers - no renaming

(21) 785 - 275 = ____ (22) 367 - 257 = ____ (23) 529 - 419 = ____ (24) 826 - 403 = ____ (25) 745 - 521 = ____

(26) 619 - 217 = ____ (27) 748 - 331 = ____ (28) 974 - 230 = ____ (29) 938 - 630 = ____ (30) 596 - 120 = ____

D: Subtracting 3-digit numbers - renaming

(31) 830 - 263 = ____ (32) 931 - 445 = ____ (33) 474 - 285 = ____ (34) 552 - 179 = ____ (35) 724 - 279 = ____

(36) 640 - 487 = ____ (37) 816 - 587 = ____ (38) 752 - 384 = ____ (39) 630 - 386 = ____ (40) 916 - 549 = ____

E: Multiplying - mixed

41. 6 × 6 = ____
42. 4 × 7 = ____
43. 6 × 8 = ____
44. 2 × 9 = ____
45. 3 × 2 = ____
46. 0 × 5 = ____
47. 9 × 3 = ____
48. 5 × 4 = ____
49. 1 × 6 = ____
50. 10 × 7 = ____
51. 2 × 8 = ____
52. 6 × 9 = ____
53. 8 × 2 = ____
54. 5 × 5 = ____
55. 7 × 3 = ____
56. 9 × 4 = ____
57. 4 × 6 = ____
58. 6 × 7 = ____
59. 10 × 8 = ____
60. 9 × 9 = ____

F: Dividing - mixed

61. 8 ÷ 2 = ____
62. 40 ÷ 5 = ____
63. 30 ÷ 3 = ____
64. 32 ÷ 4 = ____
65. 12 ÷ 6 = ____
66. 35 ÷ 7 = ____
67. 64 ÷ 8 = ____
68. 27 ÷ 9 = ____
69. 14 ÷ 2 = ____
70. 45 ÷ 5 = ____
71. 3 ÷ 3 = ____
72. 40 ÷ 4 = ____
73. 48 ÷ 6 = ____
74. 21 ÷ 7 = ____
75. 56 ÷ 8 = ____
76. 9 ÷ 9 = ____
77. 10 ÷ 2 = ____
78. 15 ÷ 5 = ____
79. 12 ÷ 3 = ____
80. 8 ÷ 4 = ____

Section	Summary of Scores
Adding 3-digit numbers - no carrying	____ / 10
Adding 3-digit numbers - carrying	____ / 10
Subtracting 3-digit numbers - no renaming	____ / 10
Subtracting 3-digit numbers - renaming	____ / 10
Multiplying -mixed	____ / 20
Dividing - mixed	____ / 20
Total:	____ / 80

Marking Schedule (Circle **S**, **A** or **D**)
S = Shows strength (all correct)
A = Achieved (64 to 79 correct)
D = Developing (less than 64 correct)

80

Numeracy Skills Assessment - L4

B

Name: _____ School: _____ Class: _____ Date: _____

A: Adding 3-digit numbers - no carrying

(1) 103 + 294 = ____ (2) 154 + 425 = ____ (3) 436 + 403 = ____ (4) 102 + 184 = ____ (5) 357 + 301 = ____

(6) 208 + 261 = ____ (7) 202 + 746 = ____ (8) 506 + 442 = ____ (9) 315 + 261 = ____ (10) 375 + 103 = ____

B: Adding 3-digit numbers - carrying

(11) 896 + 429 = ____ (12) 597 + 793 = ____ (13) 387 + 886 = ____ (14) 538 + 596 = ____ (15) 857 + 794 = ____

(16) 789 + 791 = ____ (17) 499 + 674 = ____ (18) 865 + 696 = ____ (19) 529 + 888 = ____ (20) 685 + 679 = ____

C: Subtracting 3-digit numbers - no renaming

(21) 729 - 628 = ____ (22) 687 - 484 = ____ (23) 893 - 630 = ____ (24) 649 - 145 = ____ (25) 798 - 406 = ____

(26) 571 - 310 = ____ (27) 945 - 312 = ____ (28) 837 - 310 = ____ (29) 569 - 361 = ____ (30) 785 - 420 = ____

D: Subtracting 3-digit numbers - renaming

(31) 381 - 192 = ____ (32) 912 - 493 = ____ (33) 440 - 165 = ____ (34) 831 - 697 = ____ (35) 625 - 489 = ____

(36) 913 - 567 = ____ (37) 737 - 558 = ____ (38) 862 - 286 = ____ (39) 541 - 373 = ____ (40) 620 - 352 = ____

E: Multiplying - mixed

41. 5 × 6 = ____
42. 1 × 7 = ____
43. 3 × 8 = ____
44. 10 × 9 = ____
45. 2 × 2 = ____
46. 7 × 5 = ____
47. 2 × 3 = ____
48. 6 × 4 = ____
49. 7 × 6 = ____
50. 9 × 7 = ____
51. 1 × 8 = ____
52. 8 × 9 = ____
53. 9 × 2 = ____
54. 4 × 5 = ____
55. 6 × 3 = ____
56. 3 × 4 = ____
57. 10 × 6 = ____
58. 7 × 7 = ____
59. 4 × 8 = ____
60. 5 × 9 = ____

F: Dividing - mixed

61. 2 ÷ 2 = ____
62. 30 ÷ 5 = ____
63. 24 ÷ 3 = ____
64. 16 ÷ 4 = ____
65. 54 ÷ 6 = ____
66. 14 ÷ 7 = ____
67. 40 ÷ 8 = ____
68. 63 ÷ 9 = ____
69. 20 ÷ 2 = ____
70. 10 ÷ 5 = ____
71. 9 ÷ 3 = ____
72. 28 ÷ 4 = ____
73. 18 ÷ 6 = ____
74. 56 ÷ 7 = ____
75. 72 ÷ 8 = ____
76. 36 ÷ 9 = ____
77. 12 ÷ 2 = ____
78. 50 ÷ 5 = ____
79. 15 ÷ 3 = ____
80. 4 ÷ 4 = ____

Section	Summary of Scores
Adding 3-digit numbers - no carrying	____ / 10
Adding 3-digit numbers - carrying	____ / 10
Subtracting 3-digit numbers - no renaming	____ / 10
Subtracting 3-digit numbers - renaming	____ / 10
Multiplying -mixed	____ / 20
Dividing - mixed	____ / 20
Total:	____ / 80

Marking Schedule (Circle **S**, **A** or **D**)
S = Shows strength (all correct)
A = Achieved (64 to 79 correct)
D = Developing (less than 64 correct)

80

Numeracy Skills Assessment - L4

A

Name: *Answers* School: _____ Class: _____ Date: _____

A: Adding 3-digit numbers - no carrying

(1) 143 + 706 = **849** (2) 704 + 252 = **956** (3) 326 + 302 = **628** (4) 158 + 330 = **488** (5) 411 + 158 = **569**

(6) 104 + 173 = **277** (7) 291 + 307 = **598** (8) 263 + 215 = **478** (9) 462 + 401 = **863** (10) 206 + 532 = **738**

B: Adding 3-digit numbers - carrying

(11) 796 + 564 = **1360** (12) 947 + 579 = **1526** (13) 691 + 889 = **1580** (14) 678 + 783 = **1461** (15) 957 + 359 = **1316**

(16) 786 + 795 = **1581** (17) 867 + 268 = **1135** (18) 278 + 985 = **1263** (19) 984 + 688 = **1672** (20) 993 + 497 = **1490**

C: Subtracting 3-digit numbers - no renaming

(21) 785 - 275 = **510** (22) 367 - 257 = **110** (23) 529 - 419 = **110** (24) 826 - 403 = **423** (25) 745 - 521 = **224**

(26) 619 - 217 = **402** (27) 748 - 331 = **417** (28) 974 - 230 = **744** (29) 938 - 630 = **308** (30) 596 - 120 = **476**

D: Subtracting 3-digit numbers - renaming

(31) 830 - 263 = **567** (32) 931 - 445 = **486** (33) 474 - 285 = **189** (34) 552 - 179 = **373** (35) 724 - 279 = **445**

(36) 640 - 487 = **153** (37) 816 - 587 = **229** (38) 752 - 384 = **368** (39) 630 - 386 = **244** (40) 916 - 549 = **367**

E: Multiplying - mixed

41. 6 × 6 = **36**
42. 4 × 7 = **28**
43. 6 × 8 = **48**
44. 2 × 9 = **18**
45. 3 × 2 = **6**
46. 0 × 5 = **0**
47. 9 × 3 = **27**
48. 5 × 4 = **20**
49. 1 × 6 = **6**
50. 10 × 7 = **70**
51. 2 × 8 = **16**
52. 6 × 9 = **54**
53. 8 × 2 = **16**
54. 5 × 5 = **25**
55. 7 × 3 = **21**
56. 9 × 4 = **36**
57. 4 × 6 = **24**
58. 6 × 7 = **42**
59. 10 × 8 = **80**
60. 9 × 9 = **81**

F: Dividing - mixed

61. 8 ÷ 2 = **4**
62. 40 ÷ 5 = **8**
63. 30 ÷ 3 = **10**
64. 32 ÷ 4 = **8**
65. 12 ÷ 6 = **2**
66. 35 ÷ 7 = **5**
67. 64 ÷ 8 = **8**
68. 27 ÷ 9 = **3**
69. 14 ÷ 2 = **7**
70. 45 ÷ 5 = **9**
71. 3 ÷ 3 = **1**
72. 40 ÷ 4 = **10**
73. 48 ÷ 6 = **8**
74. 21 ÷ 7 = **3**
75. 56 ÷ 8 = **7**
76. 9 ÷ 9 = **1**
77. 10 ÷ 2 = **5**
78. 15 ÷ 5 = **3**
79. 12 ÷ 3 = **4**
80. 8 ÷ 4 = **2**

Section	Summary of Scores
Adding 3-digit numbers - no carrying	_____ / 10
Adding 3-digit numbers - carrying	_____ / 10
Subtracting 3-digit numbers - no renaming	_____ / 10
Subtracting 3-digit numbers - renaming	_____ / 10
Multiplying -mixed	_____ / 20
Dividing - mixed	_____ / 20
Total:	_____ / 80

Marking Schedule (Circle **S**, **A** or **D**)
S = Shows strength (all correct)
A = Achieved (64 to 79 correct)
D = Developing (less than 64 correct)

80

Numeracy Skills Assessment - L4

B

Name: *Answers* School: _____ Class: _____ Date: _____

A: Adding 3-digit numbers - no carrying

(1) 103 + 294 = **397** (2) 154 + 425 = **579** (3) 436 + 403 = **839** (4) 102 + 184 = **286** (5) 357 + 301 = **658**

(6) 208 + 261 = **469** (7) 202 + 746 = **948** (8) 506 + 442 = **948** (9) 315 + 261 = **576** (10) 375 + 103 = **478**

B: Adding 3-digit numbers - carrying

(11) 896 + 429 = **1325** (12) 597 + 793 = **1390** (13) 387 + 886 = **1273** (14) 538 + 596 = **1134** (15) 857 + 794 = **1651**

(16) 789 + 791 = **1580** (17) 499 + 674 = **1173** (18) 865 + 696 = **1561** (19) 529 + 888 = **1417** (20) 685 + 679 = **1364**

C: Subtracting 3-digit numbers - no renaming

(21) 729 - 628 = **101** (22) 687 - 484 = **203** (23) 893 - 630 = **263** (24) 649 - 145 = **504** (25) 798 - 406 = **392**

(26) 571 - 310 = **261** (27) 945 - 312 = **633** (28) 837 - 310 = **527** (29) 569 - 361 = **208** (30) 785 - 420 = **365**

D: Subtracting 3-digit numbers - renaming

(31) 381 - 192 = **189** (32) 912 - 493 = **419** (33) 440 - 165 = **275** (34) 831 - 697 = **134** (35) 625 - 489 = **136**

(36) 913 - 567 = **346** (37) 737 - 558 = **179** (38) 862 - 286 = **576** (39) 541 - 373 = **168** (40) 620 - 352 = **268**

E: Multiplying - mixed

41.	5 × 6 =	**30**	51.	1 × 8 =	**8**	61.	2 ÷ 2 =	**1**	71.	9 ÷ 3 =	**3**
42.	1 × 7 =	**7**	52.	8 × 9 =	**72**	62.	30 ÷ 5 =	**6**	72.	28 ÷ 4 =	**7**
43.	3 × 8 =	**24**	53.	9 × 2 =	**18**	63.	24 ÷ 3 =	**8**	73.	18 ÷ 6 =	**3**
44.	10 × 9 =	**90**	54.	4 × 5 =	**20**	64.	16 ÷ 4 =	**4**	74.	56 ÷ 7 =	**8**
45.	2 × 2 =	**4**	55.	6 × 3 =	**18**	65.	54 ÷ 6 =	**9**	75.	72 ÷ 8 =	**9**
46.	7 × 5 =	**35**	56.	3 × 4 =	**12**	66.	14 ÷ 7 =	**2**	76.	36 ÷ 9 =	**4**
47.	2 × 3 =	**6**	57.	10 × 6 =	**60**	67.	40 ÷ 8 =	**5**	77.	12 ÷ 2 =	**6**
48.	6 × 4 =	**24**	58.	7 × 7 =	**49**	68.	63 ÷ 9 =	**7**	78.	50 ÷ 5 =	**10**
49.	7 × 6 =	**42**	59.	4 × 8 =	**32**	69.	20 ÷ 2 =	**10**	79.	15 ÷ 3 =	**5**
50.	9 × 7 =	**63**	60.	5 × 9 =	**45**	70.	10 ÷ 5 =	**2**	80.	4 ÷ 4 =	**1**

F: Dividing - mixed

Section	Summary of Scores
Adding 3-digit numbers - no carrying	_____ / 10
Adding 3-digit numbers - carrying	_____ / 10
Subtracting 3-digit numbers - no renaming	_____ / 10
Subtracting 3-digit numbers - renaming	_____ / 10
Multiplying -mixed	_____ / 20
Dividing - mixed	_____ / 20
Total:	_____ / 80

Marking Schedule (Circle **S**, **A** or **D**)
S = Shows strength (all correct)
A = Achieved (64 to 79 correct)
D = Developing (less than 64 correct)

80

Strand Assessments

This section contains the following information ....

Level 4 Achievement Objectives

Number

Exploring number

Within a range of meaningful contexts, students should be able to:

- **N1** explain the meaning of negative numbers;
- **N2** explain the meaning and evaluate powers of whole numbers;
- **N3** find a fraction equivalent to one given;
- **N4** express a fraction as a decimal, and vice versa;
- **N5** express a decimal as a percentage, and vice versa;
- **N6** express quantities as fractions or percentages of a whole.

Exploring computation and estimation

Within a range of meaningful contexts, students should be able to:

- **N7** make sensible estimates and check the reasonableness of answers;
- **N8** write and solve problems involving decimal multiplication and division;
- **N9** find a given fraction or percentage of a quantity;
- **N10** explain satisfactory algorithms for addition, subtraction, and multiplication;
- **N11** demonstrate knowledge of the conventions for order of operations.

Measurement

Estimating and measuring

Within a range of meaningful contexts, students should be able to:

- **M1** carry out measuring tasks involving reading scales to the nearest graduation;
- **M2** calculate perimeters of circles, rectangles, and triangles, areas of rectangles and volumes of cuboids from measurements of length;
- **M3** read and construct a variety of scales, timetables, and charts;
- **M4** design and use a simple scale to measure qualitative data.

Developing concepts of time, rate and change

Within a range of meaningful contexts, students should be able to:

- **M5** perform calculations with time, including 24-hour clock times.

Geometry

Exploring shape and space

Within a range of meaningful contexts, students should be able to:

- **G1** construct triangles and circles, using appropriate drawing instruments;
- **G2** design the net and make a simple polyhedron to specific dimensions;
- **G3** make a model of a solid object from diagrams which show views from the top, front, side, and back;
- **G4** draw diagrams of solid objects made from cubes;
- **G5** specify location, using bearings or grid references.

Exploring symmetry and transformations

Within a range of meaningful contexts, students should be able to:

- **G6** apply the symmetries of regular polygons;
- **G7** describe the reflection or rotational symmetry of a figure or object;
- **G8** enlarge and reduce a 2-dimensional shape and identify the invariant properties.

Algebra

Exploring patterns and relationships

Within a range of meaningful contexts, students should be able to:

- **A1** find a rule to describe any member of a number sequence and express it in words;
- **A2** use a rule to make predictions;
- **A3** sketch and interpret graphs on whole number grids which represent simple everyday situations.

Exploring equations and expressions

Within a range of meaningful contexts, students should be able to:

- **A4** find and justify a word formula which represents a given practical situation;
- **A5** solve simple linear equations such as 2□ + 4 = 16.

Statistics

Statistical investigations

Within a range of meaningful contexts, students should be able to:

- **S1** plan a statistical investigation arising from the consideration of an issue or an experiment of interest;
- **S2** collect appropriate data;
- **S3** choose and construct quality data displays (frequency tables, bar charts and histograms) to communicate significant features in measurement data;
- **S4** collect and display time-series data.

Interpreting statistical reports

Within a range of meaningful contexts, students should be able to:

- **S5** report the distinctive features (outliers, cluster and shape of data distribution) of data displays;
- **S6** evaluate others' interpretations of data displays;
- **S7** make statements about implications and possible actions consistent with the results of a statistical investigation.

Exploring probability

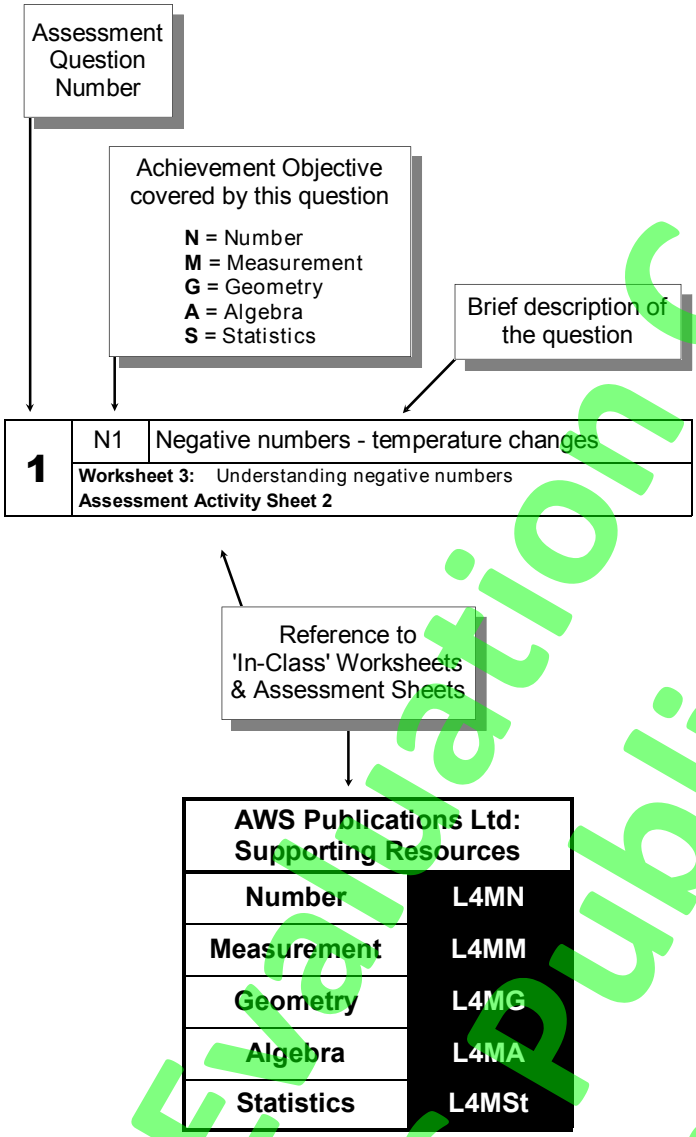
Within a range of meaningful contexts, students should be ablet to:

- **S8** estimate the relative frequencies of events and mark them on a scale;
- **S9** find all possible outcomes for a sequence of events, using tree diagrams.

Level 4

Questions & Exercise Information

How to interpret this section:



The codes in the above table refer to the following **AWS *Publications Ltd*** (formerly **AWS *Teacher Resources***) resources that support this Level 4 Assessment resource.

Code:	Resource Title
L4MN	A Complete Guide to Number, Level 4
L4MM	A Complete Guide to Measurement, Level 4
L4MG	A Complete Guide to Geometry, Level 4
L4MA	A Complete Guide to Algebra, Level 4
L4MSt	A Complete Guide to Statistics, Level 4

Number

1	N1	Negative numbers - temperature changes
	Worksheet 3: Understanding negative numbers **Assessment Activity Sheet 2**	
2	N1	Negative numbers
	Worksheet 4: Understanding and using negative numbers **Worksheet 5:** More negative numbers **Assessment Activity Sheet 2**	
3	N2	Squares and square roots
	Worksheet 6: Squares and square roots **Assessment Activity Sheet 3**	
4	N2	Cubes
	Worksheet 6: Cubes and other powers **Assessment Activity Sheet 3**	
5	N3	Equivalent fractions
	Worksheet 7: Equivalent fractions **Assessment Activity Sheet 4**	
6	N4	Converting fractions to decimals
	Worksheet 8: Expressing a fraction as a decimal **Assessment Activity Sheets 5 & 6**	
7	N4	Converting decimals to fractions
	Worksheet 8: Expressing a decimal as a fraction **Assessment Activity Sheets 5 & 6**	
8	N5	Converting percentages to decimals
	Worksheet 9: Expressing a percentage as a decimal **Assessment Activity Sheets 5 & 6**	
9	N5	Converting decimals to percentages
	Worksheet 9: Expressing a percentage as a decimal **Assessment Activity Sheets 5 & 6**	
10	N6	Expressing a quantity as a fraction or percentage
	Worksheet 10: Expressing a quantity as a fraction or percentage **Assessment Activity Sheet 6**	
11	N7	Rounding to the nearest 10, 100 or 1000
	Worksheet 11: Rounding numbers and finding estimates **Worksheet 12:** Estimating totals involving money **Assessment Activity Sheet 7**	
12	N10	Adding and subtracting decimals
	Worksheet 12: Estimating totals involving money **Worksheet 17:** Adding, subtracting and multiplying with accuracy **Assessment Activity Sheets 7 & 10**	
13	N8	Multiplying and dividing decimals
	Worksheet 14: Multiplying and dividing decimals **Assessment Activity Sheet 8**	
14	N9	Finding a fraction of a quantity
	Worksheet 15: Finding a fraction of a quantity **Assessment Activity Sheet 9**	
15	N9	Finding a percentage of a quantity
	Worksheet 16: Finding a percentage of a quantity **Assessment Activity Sheet 9**	
16	N9	Word problem involving division
	Worksheet 14: Multiplying and dividing decimals **Assessment Activity Sheet 8**	
17	N9	Order of operations
	Worksheet 18: Order of operations **Assessment Activity Sheet 10**	

Measurement

18	M1	Reading a scale
	Worksheet 2: Reading scales **Assessment Activity Sheet 1**	
19	M1/2	Measuring the length of a line / perimeter
	Worksheet 3: Accuracy of measurement **Worksheet 11:** Finding the perimeter of a shape **Worksheet 12:** Word problems involving perimeter **Assessment Activity Sheets 1 & 3**	
20	M2	Calculating the area of a shape
	Worksheet 14: 'If you can paint it, it has area' **Worksheet 15:** Word problems involving area **Assessment Activity Sheet 4**	
21	M2	Calculating the volume of an object
	Worksheet 16: 'If you can fill it, it has volume' **Worksheet 17:** Finding the volume of an object **Assessment Activity Sheet 5**	
22	M3	Using scales / scale diagrams
	Worksheet 19: Understanding and using scale diagrams **Assessment Activity Sheet 7**	
23	M4	Understanding a qualitative graph
	Worksheet 20: Measuring qualitative data **Assessment Activity Sheet 7**	
24	M5	Converting between a.m. / p.m. and 24hr time
	Worksheet 22: Converting between a.m. / p.m. and 24hr time **Assessment Activity Sheet 8**	
25	M5	Word problem involving time calculations
	Worksheet 21: Understanding time units / Analogue & digital time **Assessment Activity Sheet 8**	

Geometry

26	G1	Identifying and naming angles
	Worksheet 1: Geometry key facts / Naming **Assessment Activity Sheet 1**	
27	G1	Measuring angles
	Worksheet 2: Measuring and drawing angles **Assessment Activity Sheet 1**	
28	G1	Constructing a triangle
	Worksheet 7: Constructing triangles **Assessment Activity Sheet 3**	
29	G1	Calculating missing angles
	Worksheet 3: Adjacent angles on a straight line **Worksheet 4:** Angles around a point **Worksheet 5:** Vertically opposite angles **Worksheet 6:** Angles in a triangle **Assessment Activity Sheet 2**	
30	G5	Using co-ordinates to locate shapes
	Worksheet 14: Finding location using co-ordinates **Assessment Activity Sheet 6**	
31	G1	Using compass bearing to locate places
	Worksheet 15: Finding location using compass points **Assessment Activity Sheet 6**	
32	G6/7	Reflective and rotational symmetry
	Worksheet 20: Reflective symmetry **Worksheet 22:** Rotational symmetry **Assessment Activity Sheet 7**	
33	G8	Enlargements
	Worksheet 24: Finding the scale factor for an enlargement **Worksheet 25:** Drawing enlargements **Assessment Activity Sheet 8**	

Algebra

34	A2	Creating part of a number sequence given the rule
	Worksheet 6: Using a rule to create a number sequence **Worksheet 7:** Practical problems involving rules **Assessment Activity Sheet 3**	
35	A1	Describing a number sequence
	Worksheet 1: Creating and describing shape patterns **Worksheet 2:** Continuing a number sequence and finding the rule **Worksheet 3:** Word problems involving number sequences **Worksheet 4:** Continuing more number sequences and finding rules	
36	A3/4	Understanding everyday graphs
	Worksheet 14: Graphing real-life relationships **Worksheet 16:** Using a formula to solve practical problems **Worksheet 17:** Creating and using a formula **Assessment Activity Sheets 5 & 6**	
37	A3	Plotting points
	Worksheet 13: Graphing ordered pairs / co-ordinates **Assessment Activity Sheet 5**	
38	A5	Solving equations
	Worksheet 19: Solving equations **Assessment Activity Sheet 7**	
39	A5	Solving a word problem involving writing an equation
	Worksheet 20: Writing and solving equations for practical problems **Assessment Activity Sheet 7**	

Statistics

40	S3	Understanding histograms
	Worksheet 6: Displaying grouped discrete data as a histogram **Worksheet 7:** Displaying and organising continuous data **Assessment Activity Sheet 4**	
41	S2	Displaying grouped data in a tally chart
	Worksheet 4: Organising grouped discrete data **Assessment Activity Sheet 2**	
42	S4	Understanding time-series data
	Worksheet 4: Creating time-series data **Assessment Activity Sheet 8**	
43	S4	Mean, median, mode and range
	Worksheet 15: Calculating the mean (average score) **Worksheet 16:** Calculating the median (middle score) **Worksheet 17:** Finding the mode (most common score) **Worksheet 18:** Calculating the range (spread) **Assessment Activity Sheet 9**	
44	S4	Relative frequency / probability scales
	Worksheet 22: Calculating relative frequency / probability scales **Worksheet 25:** Using probability to predict outcomes **Assessment Activity Sheet 11**	
45	S4	Using a tree diagram to find all possible outcomes and make predictions
	Worksheet 24: Finding outcomes using tree diagrams **Worksheet 25:** Using probability to predict outcomes **Assessment Activity Sheets 12 & 13**	

A Mathematics Assessment

Name: _____

School: _____

Class: _____ **Date:** _____

Summary of Results - L4		
Strand	***Questions***	
Number	1 - 15	/55
Measurement	16 - 25	/25
Geometry	26 - 33	/22
Algebra	34 - 39	/29
Statistics	40 - 45	/30
	Total:	/161

Number

1. **Calculate** the **new** temperature.

   Starting temperature 8°C, **drops** 12°C. _____

   Starting temperature $^{-}$5°C, **rises** 7°C. _____ (2)

2. **Add** these positive and negative numbers.

   $^{-}6 + 7 =$ _____ $4 + {}^{-}9 =$ _____

   $7 + {}^{-}8 =$ _____ $^{-}3 + {}^{-}8 =$ _____ (4)

3. **Calculate** these **squares** or **square roots**.

   7^2 _____ 11^2 _____ $\sqrt{100}$ _____ (3)

4. **Explain** what 4^3 means and **work out** the answer.

   $4^3 =$ _____ = _____ (2)

5. **Match** these **equivalent fractions**.

   $^1/_4 =$ _____ $^6/_9 =$ _____

   $^3/_4 =$ _____ $^5/_{15} =$ _____

   Answers: $^5/_{20}$ $^2/_3$ $^1/_3$ $^9/_{12}$ (4)

6. **Convert** these **fractions** to **decimals**.

   $^1/_2 =$ _____ $^1/_4 =$ _____

   $^4/_5 =$ _____ $^2/_3 =$ _____ (4)

7. **Convert** these **decimals** to **fractions**.

   0.5 = _____ $0.3\dot{3} =$ _____

   0.75 = _____ 0.4 = _____ (4)

8. **Convert** these **percentages** to **decimals**.

   50% = _____ 25% = _____

   80% = _____ $66\frac{2}{3}\%$ = _____ (4)

9. **Convert** these **decimals** to **percentages**.

   0.5 = _____ 0.4 = _____

   $0.3\dot{3} =$ _____ 0.75 = _____ (4)

10. **Read** the statement and **write** the information as a **fraction** and a **percentage**. (2)

    Abbey scored 39 out of 50 in a test. _____

11. **Round** these numbers to the nearest **10**, **100** or **1000**, before working out an **estimated answer**.

    936 + 448 _____ + _____ = _____

    8148 - 793 _____ - _____ = _____

    3024 × 19 _____ × _____ = _____

    7869 ÷ 11 _____ ÷ _____ = _____ (4)

12. **Adding** and **subtracting** decimals.

    9.87 + 6.78 = _____ 29.97 + 93.86 _____ 67.25 - 41.79 _____

    6.58 - 3.96 = _____ _____ _____ (4)

13. **Multiplying** and **dividing** decimals.

    7.538 × 2.6 _____ 319.2 × 0.45 _____

    0.7) 37.52

    0.09) 4.437 (4)

14. **Find** each **fraction** of these numbers.

    $^1/_4$ of \$37.00 = _____ $^1/_5$ of \$87.50 = _____ (2)

15. **Find** each **percentage** of these numbers.

    10% of \$39.80 = _____ 25% of \$26.60 = _____ (2)

16. If \$54 is shared equally between ten people, how much does each person get? _____

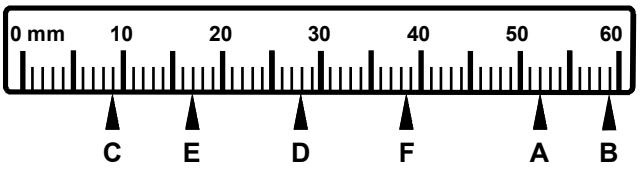
    If \$26.50 is shared equally between five people, how much does each person get? _____ (2)

17. **Order** of **operations**. BEDMAS

    6 × 8 + 54 = _____ 75 ÷ 5 - 8 = _____

    84 - 5 × 9 = _____ 81 - 63 ÷ 7 = _____ (4)

Measurement



18. On this diagram of a ruler, what is the **unit** of **measurement**? _____

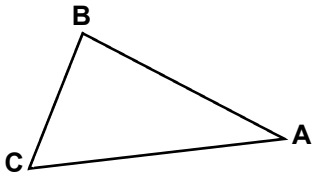
What does each **division** on the **scale** represent? _____

What are the **measurements** indicated by the pointers on this ruler?

A = _____ **B** = _____ **C** = _____

D = _____ **E** = _____ **F** = _____ (8)

19. **Measure** the **length** of each side of triangle ABC to the nearest millimetre.



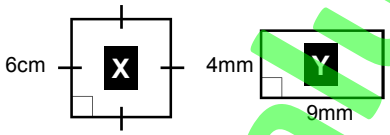
Side AB = _____

Side BC = _____

Side AC = _____

Use your answers to work out the **perimeter** of triangle ABC. _____ (4)

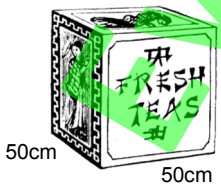
20. **Calculate** the **area** of shapes X and Y.



Area of X = _____

Area of Y = _____ (2)

21. **Calculate** the **volume** of this tea chest.

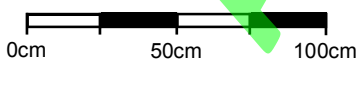


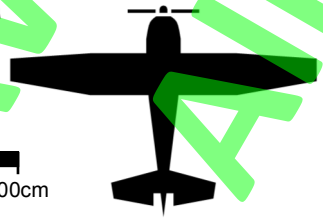
_____

_____ (2)

22. Below is a scale diagram of a model plane.

Measure the wing span on the diagram to the nearest cm. _____

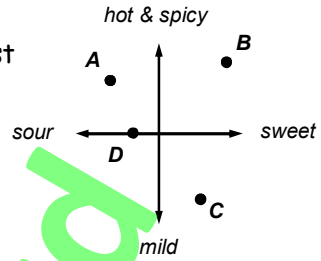




Use this scale to work out the actual length of the model plane's wing span.

Actual wing span length = _____ (2)

23. This graph shows how four foods (A, B, C, D) were rated on a taste test.



Which food was the least hot and spicy? _____

How would you describe Food B?

_____

_____ (2)

24. **Convert** these a.m. and p.m. times to 24hr time.

4:18 a.m. _____ 9:27 p.m. _____ (2)

Convert these 24hr times to a.m. or p.m. time.

2324 _____ 0742 _____ (2)

25. John started a game of golf at 1:25 p.m. and played for 3 hrs 50 min. At what time did John finish playing golf? _____ (1)

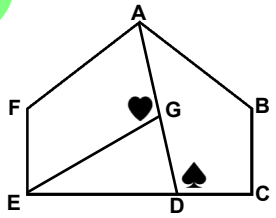
Geometry

26. Use three letters to name the angles marked with ♥ and ♠ shapes.

♥ = _____ ♠ = _____

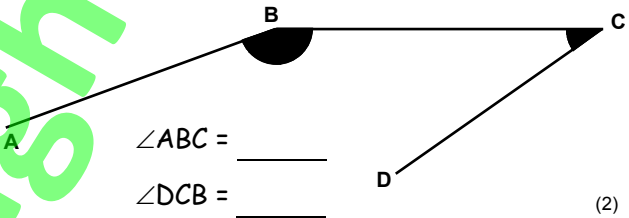
Mark ∠GED with an **X**.

Name two **acute** angles.



_____ _____ (5)

27. **Measure** angles ∠ABC and ∠DCB.



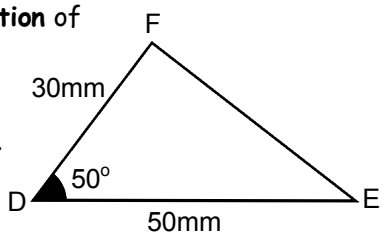
∠ABC = _____

∠DCB = _____ (2)

28. Finish the **construction** of triangle **DFE**.

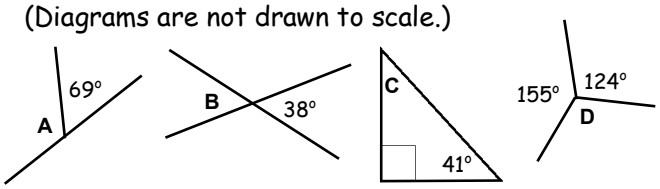
Show your construction marks. This diagram is NOT drawn to scale.

Note:
Line DE has been drawn for you.



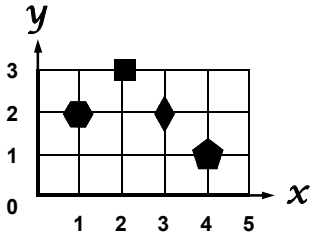
D _____ E (3)

29. **Calculate** the size of each missing angle.
(Diagrams are not drawn to scale.)



∠**A** = _____ ∠**B** = _____ ∠**C** = _____ ∠**D** = _____ (4)

30. What shape is at the point (3,2)? _____



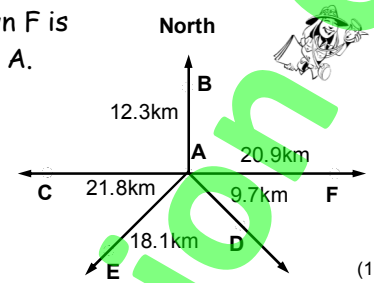
List the **co-ordinates** to locate these shapes.

⬢ = (,)

■ = (,) (3)

31. On this diagram, Town F is 20.9km east of Town A.

What is the **distance** and **direction** from Town A to Town E?

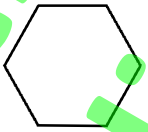


(1)

_____

32. **Draw** the **lines of symmetry** on this shape.

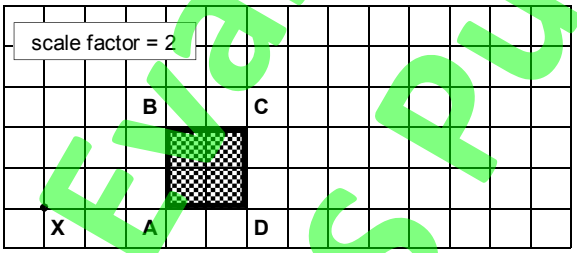
What is the **order of rotational** symmetry for this shape?



(2)

_____

33. Using **X** as the **centre of enlargement**, **enlarge** ABCD by a **scale factor of 2**.



(2)

Algebra

34. A **number sequence** was made up using the rule
'4 times the term order, minus 3',
as shown in the table below.

Use this **rule** to find the **2nd & 3rd numbers** of this **sequence**. SHOW YOUR WORKING.

Term order	Working	Number sequence
1st	4 X 1 – 3 = 1	1
2nd		
3rd		

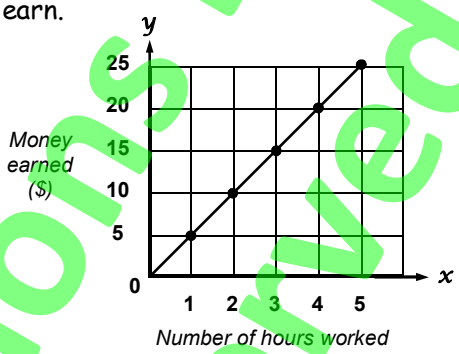
Use the same rule, '
'4 times the term order, minus 3',
to find the **7th,** _____ **10th** _____
& **50th** term _____ of this sequence. (7)

35. **Find** the next 3 numbers and **describe** how this sequence was created.

7, 11, 15, 19, 23, _____, _____, _____

_____ (5)

36. This graph shows the relationship between the number of hours Tawhai can work and the money he will earn.



If Tawhai worked for the following number of hours, how much did he earn?

1 hr = $ _____ 4 hrs = $ _____

If Tawhai earned $15.00, how many hours did he work? _____

List the points on this graph as **ordered pairs**.

( ), ( ), ( ), ( ),( )

Write a **formula** that you could use to work out how much Tawhai could earn.
Let W = Total wages and H = hours worked.

_____

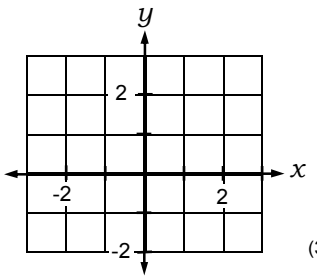
Use your **formula** to work out how much Tawhai would earn if he worked 40 hours.

_____ (8)

37. **Draw** and **label** the points ...

A = (1,2)
B = (-1,-1)
C = (1,-2)

on this graph.



(3)

38. **Work out** what **number** would go where the letter is in each equation. That is, solve each equation.

2a = 38 **a** = _____

9b = 54 **b** = _____

3c + 9 = 33 **c** = _____

5d - 8 = 22 **d** = _____ (4)

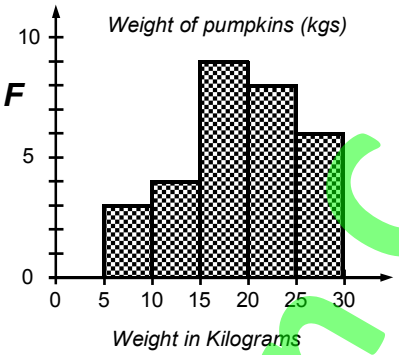
39. **Read** this word problem, **write an equation**, then **work out** the **answer**.

David likes playing cricket. This week he scored six more than twice as many runs as last week.
If he scored 52 runs this week, how many runs (r) did David score last week?

(2)

Statistics

40. This graph of continuous data is called a **histogram** and there are NO gaps between columns.



What does this graph show?

Why are there no gaps between columns?

How many pumpkins weighed between 10 and 15kgs?

How many pumpkins weighed more than 20kgs? (4)

41. The data in this box shows the number of Lego blocks used to create different models.

Organise the data using this **frequency table**.

39, 26, 11, 38, 9, 39, 26, 18, 16, 24, 35, 40, 16, 26, 13, 24, 7, 34, 26, 27, 18, 9, 23, 37, 34, 40, 9, 12, 23, 28, 8, 19

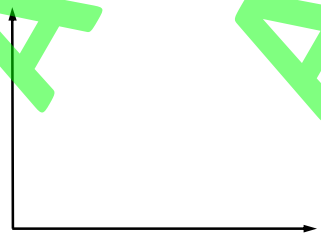
Number of blocks	Tally	F
1 -10		
11 - 20		
21 - 30		
31 - 40		

How many models were created?

How many models used 21-30 blocks?

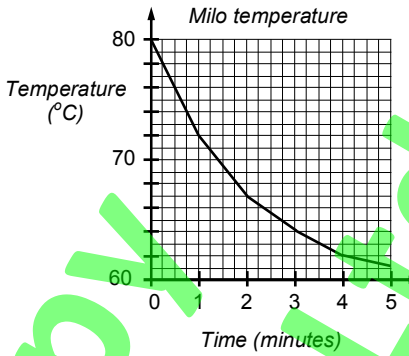
How many models used less than 20 blocks?

Draw a **histogram** to display these results.



(10)

42. The **time-series graph** below shows how the temperature of a milo drink cools down over time.



What was the starting temperature?

What was the temperature after 2 minutes?

After what time was the temperature 64°C? (3)

43. The number of sunshine hours per day was recorded for 10 days and is shown below.

4, 4, 5, 6, 7, 8, 8, 9, 9, 10

From these results **calculate** the following.

mean ___ median ___ mode ___ range ___ (4)

44. Below is a **frequency table** recording the results of an experiment where a coin was tossed.

Event	Tally	F
T	𝍸 𝍸 𝍸 𝍸 𝍸 I	
H	𝍸 𝍸 𝍸 𝍸 IIII	

Complete the **F** column of the table.

What does **H** stand for?

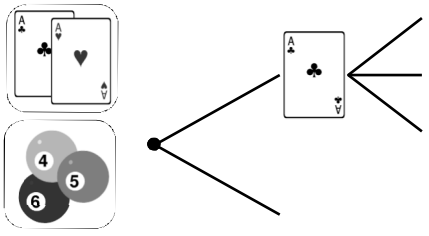
How many trials in the experiment?

What is the **relative frequency** for the event HEADS?

Mark on the **probability scale** below where these two events would go

impossible — certain (5)

45. **Complete** this **tree diagram** to show all **possible outcomes** if you select a card and a numbered ball.



How many outcomes are there?

What is the **probability** of selecting the Ace of Clubs and the number 6? (4)

B Mathematics Assessment

Name: _____

School: _____

Class: _____ **Date:** _____

Summary of Results - L4		
Strand	***Questions***	
Number	1 - 15	/55
Measurement	16 - 25	/25
Geometry	26 - 33	/22
Algebra	34 - 39	/29
Statistics	40 - 45	/30
	Total:	/161

Number

1. **Calculate** the **new** temperature.

   Starting temperature 9°C, **drops** 11°C. _____

   Starting temperature $^{-}$7°C, **rises** 8°C. _____ (2)

2. **Add** these positive and negative numbers.

   $^{-}9 + 8 =$ _____ $5 + {}^{-}11 =$ _____

   $6 + {}^{-}9 =$ _____ $^{-}4 + {}^{-}7 =$ _____ (4)

3. **Calculate** these **squares** or **square roots**.

   9^2 _____ 12^2 _____ $\sqrt{121}$ _____ (3)

4. **Explain** what 5^3 means and **work out** the answer.

   $5^3 =$ _____ = _____ (2)

5. **Match** these **equivalent fractions**.

   $^1/_3 =$ _____ $^9/_{12} =$ _____

   $^2/_3 =$ _____ $^5/_{20} =$ _____

   Answers: $^4/_{12}$ $^3/_4$ $^6/_9$ $^1/_4$ (4)

6. **Convert** these **fractions** to **decimals**.

   $^1/_2 =$ _____ $^3/_4 =$ _____

   $^1/_3 =$ _____ $^2/_5 =$ _____ (4)

7. **Convert** these **decimals** to **fractions**.

   0.5 = _____ $0.6\dot{6} =$ _____

   0.25 = _____ 0.8 = _____ (4)

8. **Convert** these **percentages** to **decimals**.

   50% = _____ 75% = _____

   60% = _____ $33\frac{1}{3}\%$ = _____ (4)

9. **Convert** these **decimals** to **percentages**.

   0.5 = _____ 0.8 = _____

   $0.6\dot{6} =$ _____ 0.25 = _____ (4)

10. **Read** the statement and **write** the information as a **fraction** and a **percentage**. (2)

    Abbey scored 41 out of 50 in a test. _____

11. **Round** these numbers to the nearest **10**, **100** or **1000**, before working out an **estimated answer**.

    309 + 748 _____ + _____ = _____

    5248 - 993 _____ - _____ = _____

    2024 × 21 _____ × _____ = _____

    2869 ÷ 11 _____ ÷ _____ = _____ (4)

12. **Adding** and **subtracting** decimals.

    5.97 + 3.68 = _____ 94.79 + 39.68 = _____ 76.13 - 54.65 = _____

    7.49 - 2.66 = _____ (4)

13. **Multiplying** and **dividing** decimals.

    49.56 × 2.5 = _____ 108.2 × 0.46 = _____

    0.8) 27.68

    0.09) 6.282 (4)

14. **Find** each **fraction** of these numbers.

    $^1/_4$ of \$39.00 = _____ $^1/_5$ of \$63.50 = _____ (2)

15. **Find** each **percentage** of these numbers.

    10% of \$27.80 = _____ 25% of \$30.60 = _____ (2)

16. If \$63 is shared equally between ten people, how much does each person get? _____

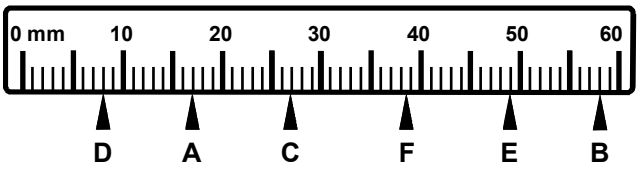
    If \$35.65 is shared equally between five people, how much does each person get? _____ (2)

17. **Order** of **operations**. BEDMAS

    9 × 8 + 37 = _____ 85 ÷ 5 - 8 = _____

    92 - 5 × 8 = _____ 81 - 56 ÷ 8 = _____ (4)

Measurement



18. On this diagram of a ruler, what is the **unit** of **measurement**? _____

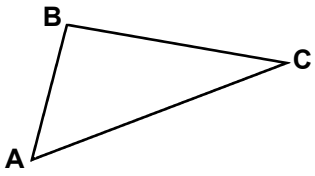
What does each **division** on the **scale** represent? _____

What are the **measurements** indicated by the pointers on this ruler?

A = _____ **B** = _____ **C** = _____

D = _____ **E** = _____ **F** = _____ (8)

19. **Measure** the **length** of each side of triangle ABC to the nearest millimetre.



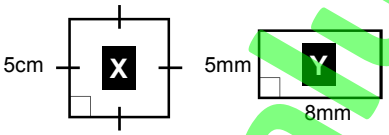
Side AB = _____

Side BC = _____

Side AC = _____

Use your answers to work out the **perimeter** of triangle ABC. _____ (4)

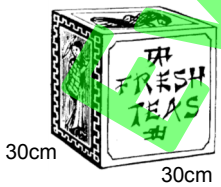
20. **Calculate** the **area** of shapes X and Y.



Area of X = _____

Area of Y = _____ (2)

21. **Calculate** the **volume** of this tea chest.

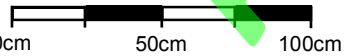


40cm _____

_____ (2)

22. Below is a scale diagram of a model plane.

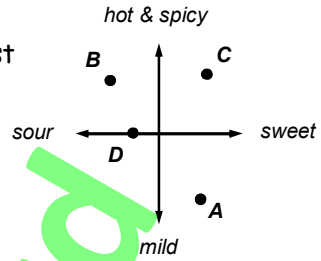
Measure the wing span on the diagram to the nearest cm. _____



Use this scale to work out the actual length of the model plane's wing span.

Actual wing span length = _____ (2)

23. This graph shows how four foods (A, B, C, D) were rated on a taste test.



Which food was the least hot and spicy? _____

How would you describe Food D?

_____

_____ (2)

24. **Convert** these a.m. and p.m. times to 24hr time.

5:29 a.m. _____ 10:38 p.m. _____ (2)

Convert these 24hr times to a.m. or p.m. time.

2215 _____ 0625 _____ (2)

25. John started a game of golf at 1:35 p.m. and played for 3 hrs 35 min. At what time did John finish playing golf? _____ (1)

Geometry

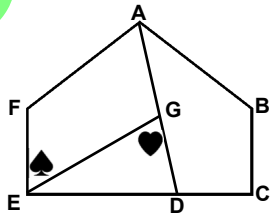
26. Use three letters to name the angles marked with ♥ and ♠ shapes.

♥ = _____ ♠ = _____

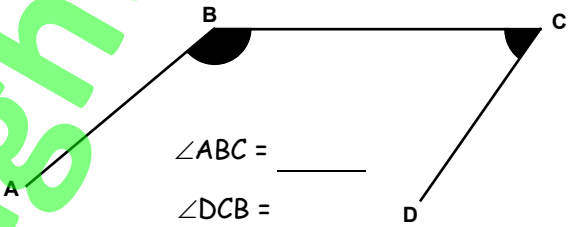
Mark ∠DAB with an **X**.

Name two **obtuse** angles.

_____ _____ (5)



27. **Measure** angles ∠ABC and ∠DCB.



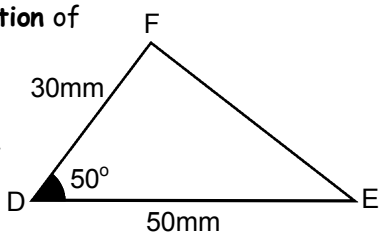
∠ABC = _____

∠DCB = _____ (2)

28. Finish the **construction** of triangle **DFE**.

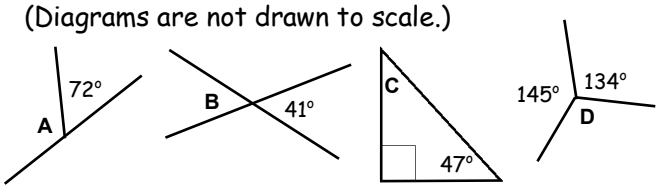
Show your construction marks. This diagram is NOT drawn to scale.

Note:
Line DE has been drawn for you.



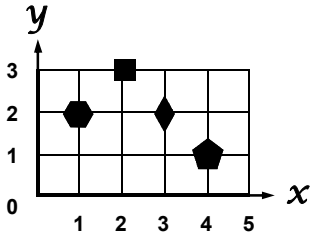
D _____ E (3)

29. **Calculate** the size of each missing angle.
(Diagrams are not drawn to scale.)



∠A = _____ ∠B = _____ ∠C = _____ ∠D = _____ (4)

30. What shape is at the point (1,2)? _____



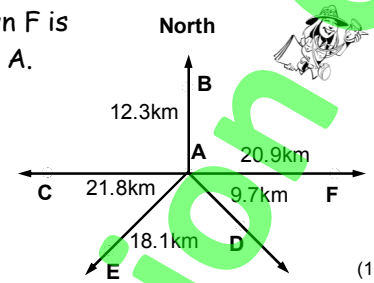
List the **co-ordinates** to locate these shapes.

= (,)

= (,) (3)

31. On this diagram, Town F is 20.9km east of Town A.

What is the **distance** and **direction** from Town A to Town D?



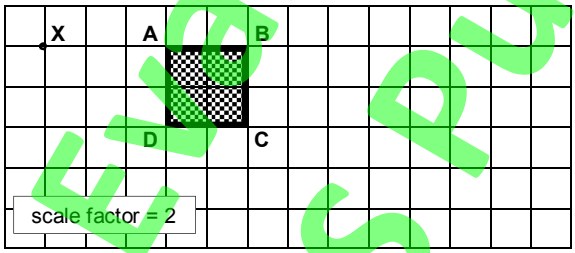
_____ (1)

32. **Draw** the **lines of symmetry** on this shape.

What is the **order of rotational** symmetry for this shape?

_____ (2)

33. Using **X** as the **centre of enlargement**, **enlarge** ABCD by a **scale factor of 2**.



(2)

Algebra

34. A **number sequence** was made up using the rule
'3 times the term order, plus 5',
as shown in the table below.

Use this **rule** to find the **2nd & 3rd numbers** of this **sequence**. SHOW YOUR WORKING.

Term order	Working	Number sequence
1st	$3 \times 1 + 5 = 8$	8
2nd		
3rd		

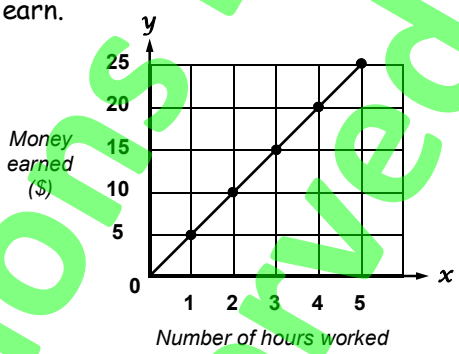
Use the same rule, '
'3 times the term order, plus 5',
to find the **7th**, _____ **10th** _____
& **50th** term _____ of this sequence. (7)

35. **Find** the next 3 numbers and **describe** how this sequence was created.

5, 9, 13, 17, 21, _____ , _____ , _____

_____ (5)

36. This graph shows the relationship between the number of hours Tawhai can work and the money he will earn.



If Tawhai worked for the following number of hours, how much did he earn?

2 hrs = $ _____ 5 hrs = $ _____

If Tawhai earned $20.00, how many hours did he work? _____

List the points on this graph as **ordered pairs**.

( ), ( ), ( ), ( ),( )

Write a **formula** that you could use to work out how much Tawhai could earn.
Let W = Total wages and H = hours worked.

_____

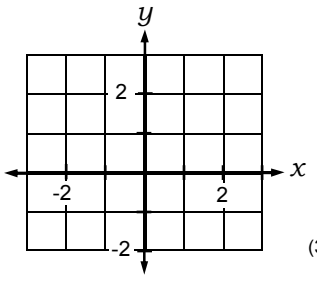
Use your **formula** to work out how much Tawhai would earn if he worked 50 hours.

_____ (8)

37. **Draw** and **label** the points ...

A = (2,1)
B = (-2,-1)
C = (2,-2)

on this graph.



(3)

38. **Work out** what **number** would go where the letter is in each equation. That is, solve each equation.

2a = 34 **a** = _____
9b = 72 **b** = _____
4c + 9 = 41 **c** = _____
5d - 7 = 33 **d** = _____ (4)

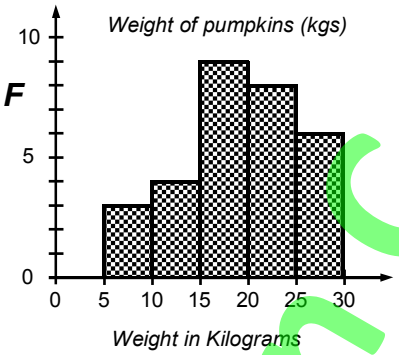
39. **Read** this word problem, **write an equation**, then **work out** the **answer**.

David likes playing cricket. This week he scored seven more than twice as many runs as last week.
If he scored 43 runs this week, how many runs (r) did David score last week?

(2)

Statistics

40. This graph of continuous data is called a **histogram** and there are NO gaps between columns.



What does this graph show?

Why are there no gaps between columns?

How many pumpkins weighed between 25 and 30kgs?

How many pumpkins weighed less than 15kgs? (4)

41. The data in this box shows the number of Lego blocks used to create different models.

Organise the data using this **frequency table**.

13, 24, 7, 34, 26, 27, 18, 9, 23, 37, 34, 40, 9, 12, 23, 28, 8, 19, 39, 26, 11, 38, 9, 39, 26, 18, 16, 24, 35, 40, 16, 26,

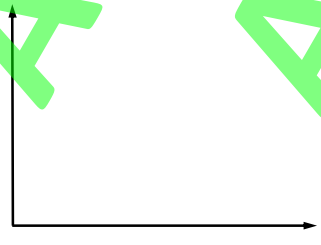
Number of blocks	Tally	F
1 -10		
11 - 20		
21 - 30		
31 - 40		

How many models were created?

How many models used 11-20 blocks?

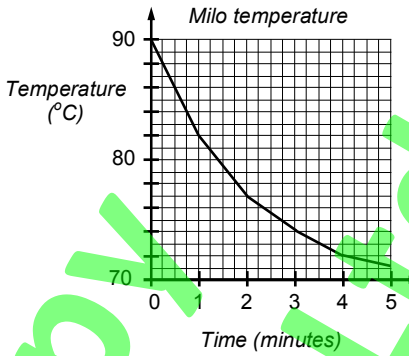
How many models used more than 20 blocks?

Draw a **histogram** to display these results.



(10)

42. The **time-series graph** below shows how the temperature of a milo drink cools down over time.



What was the starting temperature?

What was the temperature after 4 minutes?

After what time was the temperature 82°C? (3)

43. The number of sunshine hours per day was recorded for 10 days and is shown below.

5, 5, 6, 7, 8, 9, 9, 10, 10, 11

From these results **calculate** the following.

mean ___ median ___ mode ___ range ___ (4)

44. Below is a **frequency table** recording the results of an experiment where a coin was tossed.

Event	Tally	F
T	𝍸 𝍸 𝍸 𝍸 IIII	
H	𝍸 𝍸 𝍸 𝍸 I	

Complete the **F** column of the table.

What does **T** stand for?

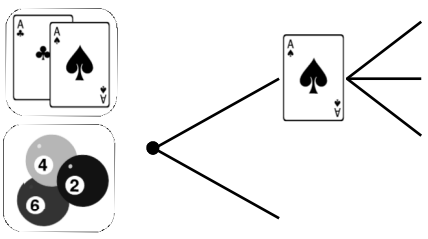
How many trials in the experiment?

What is the **relative frequency** for the event TAILS?

Mark on the **probability scale** below where these two events would go.

impossible ——— certain (5)

45. **Complete** this **tree diagram** to show all **possible outcomes** if you select a card and a numbered ball.



How many outcomes are there?

What is the **probability** of selecting the Ace of Clubs and the number 2? (4)

A Marking Schedule

The purpose of these assessments is to assist you to determine the areas of strength and weakness for the pupils in your class.

- While some questions require more than one answer, most answers are worth **1 MARK**, as indicated by the number of ***'ticks'*** in the **marking column** of the marking schedule.
- *Example:* ✓✓✓✓ means 4 MARKS, one for each correct answer as in the illustration below.

9.87 + 6.78 =	_____	29.97 + 93.86	67.25 - 41.79
6.58 - 3.96 =	_____	_____	_____

Any variation to this will be indicated in the marking column.

- On the **Assessments Sheet**, the total value of each question is indicated by the number in brackets.
  Example: (4) means the question is worth 4 marks.

Recording Results

At the end of this resource, there are various **Assessment Record Sheets** that can be used to record the results. When using the **'Question by Question Analysis Sheet'**, for questions with more than one answer, a pupil must get at least HALF of the answers correct to be credited with understanding the achievement objective being covered.

- *Example:* For this question below, 3 out of 4 would indicate 'understanding' has been achieved.

9.87 + 6.78 =	_____	29.97 + 93.86	67.25 - 41.79
6.58 - 3.96 =	_____	_____	_____

For more information, refer to the **Assessment Sheets** section after the marking schedules.

Note:
The marking schedule and recording ideas given are only an indication of how to mark / record the results. It does not mean you have to mark / record the assessment / results this way. How you allocate marks and record results is up to you, but it is important that there is consistency between marking / recording parallel assessments and marking / recording between teachers of different classes.

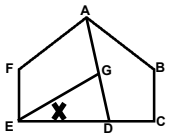
FEEDBACK:
Any feedback on how this resource could be improved would be appreciated.

Number	Marking
1. -4°C, 2°C	✓✓
2. 1, -5, -1, -11	✓✓✓✓
3. 49, 121, 10	✓✓✓
4. 4 x 4 x 4 = 64	✓✓
5. $^5/_{20}$, $^2/_3$, $^9/_{12}$, $^1/_3$	✓✓✓✓
6. 0.5, 0.25, 0.8, 0.6	✓✓✓✓
7. $^1/_2$, $^1/_3$, $^3/_4$, $^4/_{10}$ or $^2/_5$	✓✓✓✓
8. 0.5, 0.25, 0.8, 0.6	✓✓✓✓
9. 50%, 40%, $33\frac{1}{3}$%, 75%	✓✓✓✓
10. $^{39}/_{50}$, 78%	✓✓
11. Check that rounding is correctly done and that answer is consistent with rounding used. *Example:* 940 + 450 = 1390 or 900 + 400 = 1300	(rounding) ✓✓ (answers) ✓✓
12. 16.65, 2.62, 123.83, 25.46	✓✓✓✓
13. 19.5988, 143.64, 53.6, 49.3	✓✓✓✓
14. $9.25, $17.50	✓✓
15. $3.98, $6.65	✓✓
16. $5.40, $5.30	✓✓
17. 102, 7, 39, 72	✓✓✓✓
	55

Measurement	Marking
18. millimetre, 1mm	✓✓
A = 52mm, B = 59mm, C = 9mm	✓✓✓
D = 28mm, E = 17mm, F = 38.5mm	✓✓✓
19. AB = 30mm ± 1mm, BC = 19mm ± 1mm, AC = 35mm ± 1mm,	✓✓✓
perimeter = 84mm	✓
(Check 'perimeter' **total** added correctly)	
20. X = 36cm^2, Y = 36mm^2	✓✓
21. 150000cm^3	answer ✓ units ✓
22. 4cm, 100cm	✓✓
23. C, sweet yet hot and spicy	✓✓
24. 0418, 2127	✓✓
11:24 p.m. 7:42 a.m.	✓✓
25. 5:15 p.m.	✓
	25

Geometry

26. ∠AGE, ∠GDC



Acute angles:
any TWO angles named
less than 90°

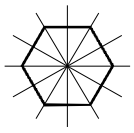
27. 160°, 35°

28. Check construction:
correct angle size ∠FDE,
correct length of side DF
drawing line EF

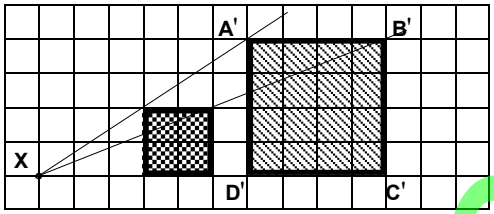
29. 111°, 38°, 49°, 81°

30. rhombus, (1,2), (2,3)

31. 18.1km south west of A

32. 

rotational symmetry = 6

33. 

Marking
✓✓
✓
✓✓
✓✓
✓
✓
✓
✓✓✓✓
✓✓✓
✓
✓
✓
correct position ✓
correct size ✓
22

Algebra

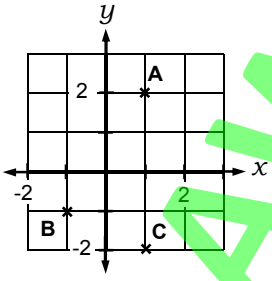
34. 4 x 2 - 3 = 5
4 x 3 - 3 = 9

4 x 7 - 3 = 25, 4 x 10 - 3 = 37,
4 x 50 - 3 = 197

35. 27, 31, 35
start with 7, add four to each new number
(Rule: $4x + 3$, where x = term order)

36. $5, $20, 3hrs
(1,5), (2,10), (3,15), (4,20), (5,25)

W = 5H,
$200 - (check answer for 40hrs is consistent with the formula created by student)

37. 

38. a = 19, b = 6, c = 8, d = 6

39. Let r = number of runs scored last week
2r + 6 = 52, r = 23 runs

Marking
working ✓✓
answers ✓✓
✓✓
✓✓✓
✓
✓
✓✓✓
✓✓✓
- 1 for each error
✓
✓
✓✓✓
✓✓✓✓
✓
✓
29

Statistics

40. Weight of pumpkins in kilograms,

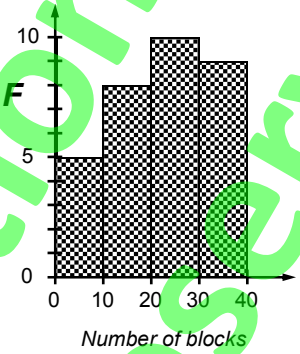
Because this is continuous data obtained by measuring,

4, 14

41.

Number of blocks	Tally	F
1 -10	𝍸	5
11 - 20	𝍸 III	8
21 - 30	𝍸 𝍸	10
31 - 40	𝍸 IIII	9
		32

32, 10, 13



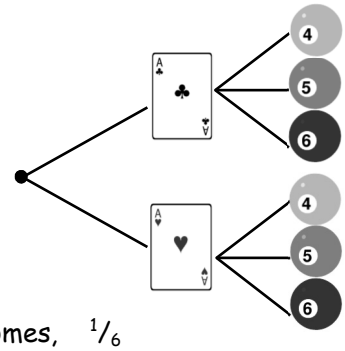
42. 80°C, 67°C, 3 minutes

43. 7, 7.5, 4, 8 & 9, 6

44.

Event	Tally	F
T	𝍸 𝍸 𝍸 𝍸 𝍸 I	26
H	𝍸 𝍸 𝍸 𝍸 IIII	24
		50

H = heads on the coin, 50, $^{24}/_{50}$

45. 

6 outcomes, $^{1}/_{6}$

Marking
✓
✓
✓✓
Tally ✓✓
Total ✓✓
✓✓✓
title ✓
labels ✓
columns ✓
✓✓✓
✓✓✓✓
✓
✓✓✓
✓
✓✓
✓✓
30

Total: **161**

B Marking Schedule

The purpose of these assessments is to assist you to determine the areas of strength and weakness for the pupils in your class.

- While some questions require more than one answer, most answers are worth **1 MARK**, as indicated by the number of ***'ticks'*** in the **marking column** of the marking schedule.
- *Example:* ✓✓✓✓ means 4 MARKS, one for each correct answer as in the illustration below.

9.87 + 6.78 =	_____	29.97 + 93.86	67.25 - 41.79
6.58 - 3.96 =	_____	_____	_____

Any variation to this will be indicated in the marking column.

- On the **Assessments Sheet**, the total value of each question is indicated by the number in brackets.
  Example: (4) means the question is worth 4 marks.

Recording Results

At the end of this resource, there are various **Assessment Record Sheets** that can be used to record the results. When using the **'Question by Question Analysis Sheet'**, for questions with more than one answer, a pupil must get at least HALF of the answers correct to be credited with understanding the achievement objective being covered.

- *Example:* For this question below, 3 out of 4 would indicate 'understanding' has been achieved.

9.87 + 6.78 =	_____	29.97 + 93.86	67.25 - 41.79
6.58 - 3.96 =	_____	_____	_____

For more information, refer to the **Assessment Sheets** section after the marking schedules.

Note:
The marking schedule and recording ideas given are only an indication of how to mark / record the results. It does not mean you have to mark / record the assessment / results this way. How you allocate marks and record results is up to you, but it is important that there is consistency between marking / recording parallel assessments and marking / recording between teachers of different classes.

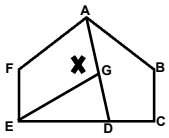
FEEDBACK:
Any feedback on how this resource could be improved would be appreciated.

Number	Marking
1. -2°C, 1°C	✓✓
2. -1, -3, -6, -11	✓✓✓✓
3. 81, 144, 11	✓✓✓
4. 5 x 5 x 5 = 125	✓✓
5. $^4/_{12}$, $^6/_9$, $^3/_4$, $^1/_4$	✓✓✓✓
6. 0.5, 0.3˙, 0.75, 0.4	✓✓✓✓
7. $^1/_2$, $^1/_4$, $^2/_3$, $^8/_{10}$ or $^4/_5$	✓✓✓✓
8. 0.5, 0.6, 0.75, 0.3˙	✓✓✓✓
9. 50%, $66\frac{2}{3}$%, 80%, 25%	✓✓✓✓
10. $^{41}/_{50}$, 82%	✓✓
11. Check that rounding is correctly done and that the answer is consistent with rounding used. *Example:* 940 + 450 = 1390 or 900 + 400 = 1400	(rounding) ✓✓ (answers) ✓✓
12. 9.65, 4.83, 134.47, 21.48	✓✓✓✓
13. 123.9, 49.772, 34.6, 69.8	✓✓✓✓
14. $9.75, $12.70	✓✓
15. $2.78, $7.65	✓✓
16. $6.30, $7.13	✓✓
17. 109, 52, 9, 74	✓✓✓✓
	55

Measurement	Marking
18. millimetre, 1mm	✓✓
A = 17mm, B = 58mm, C = 27mm	✓✓✓
D = 8mm, E = 49mm, F = 38.5mm	✓✓✓
19. AB = 18mm ± 1mm, BC = 30mm ± 1mm, AC = 37mm ± 1mm,	✓✓✓
perimeter = 85mm	✓
(Check 'perimeter' **total** added correctly)	
20. X = 25cm^2, Y = 40mm^2	✓✓
21. 36000cm^3	answer ✓ units ✓
22. 3cm, 75cm	✓✓
23. A, sour	✓✓
24. 0529, 2238	✓✓
10:15 p.m. 6:25 a.m.	✓✓
25. 5:10 p.m.	✓
	25

Geometry

26. ∠EGD, ∠FEG



Obtuse angles:
any TWO angles named
greater than 90° less than 180°

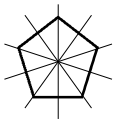
27. 140°, 55°

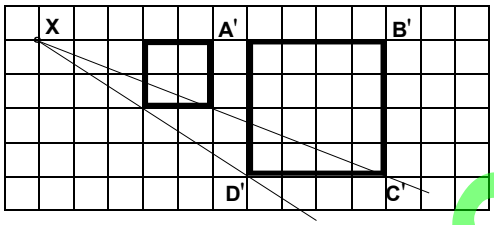
28. Check construction:
correct angle size ∠FDE,
correct length of side DF
drawing line EF

29. 108°, 41°, 43°, 81°

30. hexagon, (4,1), (3,2)

31. 9.7km south east of A

32. 
rotational symmetry = 5

33. 

Marking
✓✓
✓
✓✓
✓✓
✓
✓
✓
✓✓✓✓
✓✓✓
✓
✓
✓
correct position ✓
correct size ✓
22

Algebra

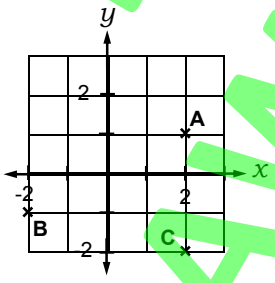
34. 3 x 2 + 5 11
3 x 3 + 5 14

3 x 7 + 5 = 26, 3 x 10 + 5 = 35,
3 x 50 + 5 = 155

35. 25, 29, 33
start with 5, add four to each new number
(Rule: $4x + 1$, where x = term order)

36. $10, $50, 4hrs
(1,5), (2,10), (3,15), (4,20), (5,25)

W = 5H,
$250 – (check answer for 50hrs is consistent with the formula created by student)

37. 

38. a = 17, b = 8, c = 8, d = 8

39. Let r = number of runs scored last week
2r + 7 = 43, r = 18 runs

Marking
working ✓✓
answers ✓✓
✓✓✓
✓✓✓
✓
✓
✓✓✓
✓✓✓
- 1 for each error
✓
✓
✓✓✓
✓✓✓
✓
✓
29

Statistics

40. Weight of pumpkins in kilograms,

Because this is continuous data obtained by measuring,

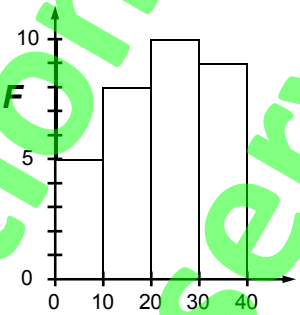
6, 7

41.

Number of blocks	Tally	F
1 -10	𝍸	5
11 - 20	𝍸 |||	8
21 - 30	𝍸 𝍸	10
31 - 40	𝍸 ||||	9
		32

32, 8, 19

Blocks used to build models



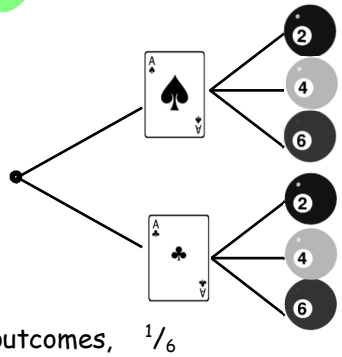
42. 90°C, 72°C, 1 minute

43. 8, 8.5, 5, 9 & 10, 6

44.

Event	Tally	F
T	𝍸 𝍸 𝍸 𝍸 ||||	24
H	𝍸 𝍸 𝍸 𝍸 𝍸 |	26
		50

T = tails on the coin, 50, $^{24}/_{50}$

45. 

6 outcomes, $^{1}/_{6}$

Marking
✓
✓
✓✓
Tally ✓✓
Total ✓✓
✓✓✓
title ✓
labels ✓
columns ✓
✓✓✓
✓✓✓✓
✓
✓✓✓
✓
✓✓
30

Total: **161**

Assessment Sheets

This section contains the following information ....

1

Cumulative Record Sheet

The **Cumulative Record Sheet** is designed to record the results of each Numeracy Skills / Strand Assessment as a pupil progresses through a school. This allows you to follow the progress of individual pupils over a period of several years.

2

Pupil Assessment Record Sheet

The Pupil Assessment Record Sheet is designed to record the results of each of the parallel versions of the Multi-Level Assessments given to a pupil during the course of a year. With a space for comments, this sheet allows you to track the progress throughout a year and measure the 'value added'.

3

Class Assessment Record Sheet

The Class Assessment Record Sheet is designed to record the results of a class on one or two sheets, therefore giving an overall impression of the strengths and weaknesses at any particular level.

4

Question by Question Analysis Record Sheet

The Strand Analysis Sheet is designed to plot question by question results to provide a detailed analysis of each pupil's ability in a particular strand for the level that is being assessed. By highlighting correct answers on the sheet for each pupil, patterns of strengths and weaknesses will become apparent, providing information that will assist you when making up classes / groups within classes or deciding upon / adapting your teaching programme.

Note:

Within the **Numeracy Skills Assessment** section of the record sheet, the letters **A**, **B**, **C** & **D** refer to the parallel **Numeracy Skills Assessments**.

Within the **Strand Assessment** section of the record sheet, the letters **N**, **M**, **G**, **A** & **S** refer the strand being assessed.
N = Number, **M** = Measurement, **G** = Geometry, **A** = Algebra & **S** = Statistics

Cumulative Mathematics Record:

Class	Year

Class	Year

Name: _____

Numeracy / Strand Assessment Results:

	Numeracy Skills				Strand Assessment A						Strand Assessment B					
Level 1	A	B	C	D	N	M	G	A	S	Total	N	M	G	A	S	Total
Class:																
Year:	Comments:				Comments:						Comments:					
Level 2	A		B		N	M	G	A	S	Total	N	M	G	A	S	Total
Class:																
Year	Comments:				Comments:						Comments:					
Level 3	A		B		N	M	G	A	S	Total	N	M	G	A	S	Total
Class:																
Year	Comments:				Comments:						Comments:					
Level 4	A		B		N	M	G	A	S	Total	N	M	G	A	S	Total
Class:																
Year	Comments:				Comments:						Comments:					
Level 5	A		B		N	M	G	A	S	Total	N	M	G	A	S	Total
Class:																
Year	Comments:				Comments:						Comments:					

Pupil Assessment Record Sheet - Level 4

Name: **Class:**

Numeracy Skills

A	___/80	Date: Comments:
B	___/80	Date: Comments:

Strand Assessment A

N	___/55	Date: Comments:
M	___/25	
G	___/22	
A	___/29	
S	___/30	
Total:	___/161	

Strand Assessment B

N	___/55	Date: Comments:
M	___/25	
G	___/22	
A	___/29	
S	___/30	
Total:	___/161	

AWS

Class Record Sheet for Numeracy Skills / Strand Assessments - LEVEL 4

Class:	Numeracy Skills		Strand Assessment A Date:						Strand Assessment B Date:					
Write Date of Assessment after LETTER ➔	A	B	N	M	G	A	S	Total	N	M	G	A	S	Total
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Level 4	Question by Question Analysis Sheet - A / B	Date:

	Class List:	Objective covered																			
Number	1	N1																			
	2	N1																			
	3	N2																			
	4	N2																			
	5	N3																			
	6	N4																			
	7	N4																			
	8	N5																			
	9	N5																			
	10	N6																			
	11	N7																			
	12	N10																			
	13	N8																			
	14	N9																			
	15	N9																			
	16	N9																			
	17	N9																			
Measurement	18	M1																			
	19	M1																			
	20	M2																			
	21	M2																			
	22	M3																			
	23	M4																			
	24	M5																			
	25	M5																			
Geometry	26	G1																			
	27	G1																			
	28	G1																			
	29	G1																			
	30	G5																			
	31	G1																			
	32	G6																			
	33	G8																			
Algebra	34	A2																			
	35	A1																			
	36	A3/4																			
	37	A3																			
	38	A5																			
	39	A5																			
Statistics	40	S3																			
	41	S2																			
	42	S4																			
	43	S4																			
	44	S4																			
	45	S4																			