

Summary

Test Identification

Name	2019 MAT SW 1.6
Date Created	02 Feb 2019
Date Modified	21 Feb 2019
Subject	Mathematics
Status	SCORED
Sequence Number	892968
Total Test Time	57 minutes
Delivery Method	Onscreen

Curriculum Strand

Number Sense & Operations	13	Statistics	10
Algebra	14		

Curriculum Level

5B	2	5P	2	5A	6
6B	11	6P	15	6A	9

Cognitive Processing

Surface	15	Deep	33
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Slider Settings

Strands		Level	
Number Sense & Operations	Most	Level 6	Most
Algebra	Most		
Statistics	Most		

Marking Guide : 2019 MAT SW 1.6

Q.No	Marking Key
1	d
2	c
3	a
4	a
5	b
6	d
7	c
8	d
9	Mean Geltz = 22. Mean Luna = 20 'Need both correct for 1 mark'
10	Median Geltz = 19, Median Luna = 22 'Need both correct answers for 1 mark'
11	Option: Recommend Luna because according to the median, there is a 50% chance of Luna scoring 22 in a game (to Geltz's 19). 'Need to identify a player AND make a strong justification for inclusion based on data measures, for 1 mark'
12	6
13	b
14	d
15	b
16	Which family has the cheapest grocery bill? Or similar 'Could use words like "compare" or "explore" or "relationship" to indicate a suitable investigation'
17	a
18	Are the numbers of pigs in her region increasing? OR How does my region compare with NZ for stock numbers? OR similar 'Must refer to her region. Could use words like "compare" or "explore" or "relationship" to indicate a suitable investigation'
19	d
20	b
21	c
22	d
23	a
24	a
25	a

Instructions

Underlined Questions e.g. 10 :Use teacher judgement. Give 1 if answer matches marking guide (unless otherwise instructed). For incorrect answers give 0 (zero).

All other Questions: Enter the response chosen by the student using letters. For example, 'a' for the first option; 'b' for the second option; 'c' for the third option and so on.

Questions Not Answered: Enter a dash (-).

Q.No	Marking Key
26	d
27	c
28	c
29	Use Pi is approx 3
30	24
31	a
32	Do not know the marks of individual students in English and Maths, or similar explanation.
33	d
34	c
35	a
36	a
37	b
38	d
39	b
40	\$42.09 or \$42 or \$42.10
41	a
42	c
43	d
44	d
45	84 to 89 million
46	b
47	a
48	d

Instructions

Underlined Questions e.g. 10 :Use teacher judgement. Give 1 if answer matches marking guide (unless otherwise instructed). For incorrect answers give 0 (zero).

All other Questions: Enter the response chosen by the student using letters. For example, 'a' for the first option; 'b' for the second option; 'c' for the third option and so on.

Questions Not Answered: Enter a dash (-).

Choose a circle to show how much each sentence is like you

Very Unlike Me 1	Unlike Me 2	Like Me 3	Very Like Me 4
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01. I like maths at school.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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02. I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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03. My teacher thinks I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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04. My Mum and Dad think I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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05. I enjoy doing maths in my own time (not at school).

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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06. I enjoy doing things in maths that I haven't tried before.

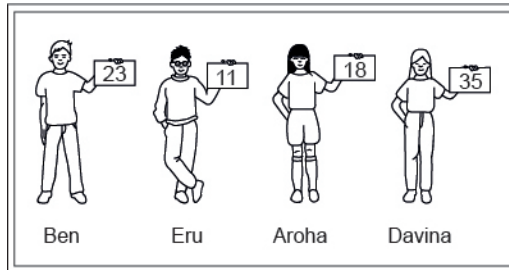
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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ADMINISTER ON SCREEN ONLY

Practice Questions

These practice questions are to help you understand how to show your answer for different types of questions.

P01. Who is holding a card with an even number on it?

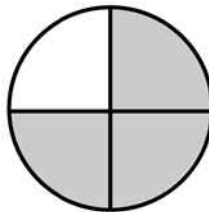


- Ben
- Eru
- Aroha
- Davina

P02. Complete this number pattern.

2, 4, _____, _____, 10

P03. What fraction of this circle is shaded?

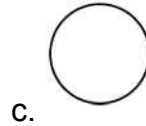
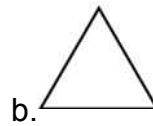




P04. Match the sentence with the correct shape.

1. I have three sides

2. I have 4 sides



P05. Which numbers make this number sentence **TRUE**?

$$2 + \star > 5$$

1

2

3

4

5

P06. Put the numbers 1, 2, 3, and 4 in the boxes to order these numbers from biggest (1) to smallest (4).

3

7

2

0

P07. Select whether the following statements are True or False.

In the number 213, the value of 1 is ten.

TRUE

FALSE

In the number 504, the value of 5 is fifty.

ADMINISTER ON SCREEN
ONLY

01. According to the graph below, how many times did the yearly increase of the price of a hamburger exceed 10 cents?



- None
- One
- Two
- Three
- Four

02. Which shows 833 000 written in scientific notation?

- 8.33×10^3
- 8.33×10^4
- 8.33×10^5
- 8.33×10^6

03. What percent of 175 is 7?

- 4%
- 12.25%
- 25%
- 40%

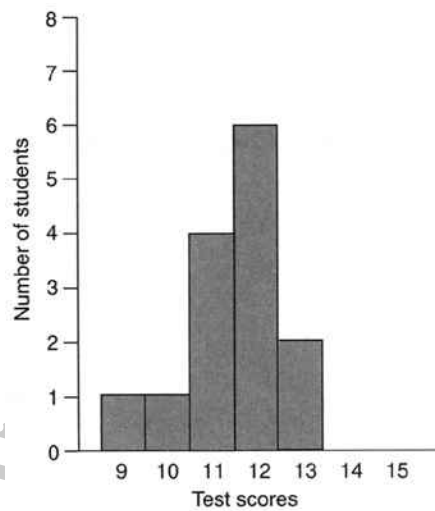
04. What is the standard notation for the following expression?

$$1.35 \times 10^{-2}$$

- 0.0135
- 0.135
- 135
- 13500

05. The results of a Year 10 Geography class test are shown in the frequency histogram below.

For this data,



- the mode is 12 and the median is 11.
- the mode is 12 and the median is 12.
- the mode is 11 and the median is 11.
- the mode is 11 and the median is 12.

06. 0.4^3 is equal to

- 1.2
- 0.16
- 0.64
- 0.064

07.

$$\square \times \square = 41$$

The \square can be replaced by:

- 41^2
- $4^2 + 5^2$
- $\sqrt{41}$
- $\frac{41}{2}$

08. A company keeps a list of 50 employees and their annual salaries. The salary of the very highly paid president is added to this list. Which of the following statistics is **MOST** likely to be approximately the same or nearly the same for the original list and the new list?

- The highest salary
- The range
- The mean
- The median

Use the following information to answer questions 09 to 11.

The coach for the All-Star Basketball Game needs to pick one of two players for the team. The table below shows the number of points each of the players scored in his last 10 games.

Name of player	Number of points scored in last ten games
Geltz	18, 32, 28, 18, 14, 28, 10, 16, 36, 20
Luna	22, 17, 23, 8, 24, 24, 22, 20, 18, 22

09. Find the mean (average) number of points scored by each player.

10. Find the median number of points scored by each player.

11. Based on the data, which player would you recommend for the All-Star team?

End of Section

Use the following information to answer question 12..

A baseball player's batting average is determined by dividing the number of safe hits by the number of turns at bat. Batting averages are expressed as decimals rounded to three places.

For example, a player who made 15 safe hits in 48 turns at bat would have a batting average of .313.

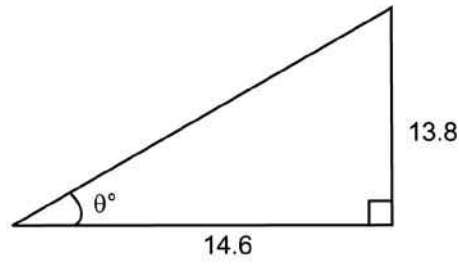
12. Assume that the player begins with 15 safe hits in 48 turns at bat.

How many safe hits would the player need in his next 10 turns at bat in order to increase his batting average from .313 to .362?

Number of safe hits _____

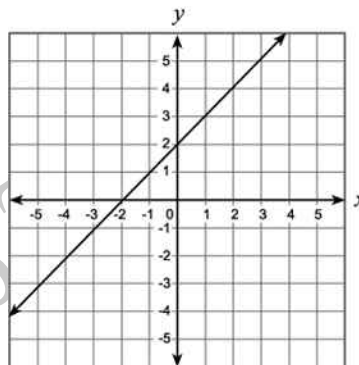
End of Section

13. The value of θ , correct to 1 decimal place, is:



- 70.9
- 43.4
- 19.1
- 46.6
- 31.7

14. Which equation **BEST** represents this graph?



- $y = -x$
- $y = 2x + 2$
- $y = x - 2$
- $y = x + 2$

15. What is the solution to the inequality

$$7x - 5 \geq x + 1?$$

- $x \leq 1$
- $x \geq 1$
- $x \geq -1$
- $x \leq \frac{5}{2}$

Use the following information to answer question 16..

As part of a statistics project Rose collected the following data on the weekly food bill for two families one in Wellington and the other in Whangarei. To do this:

- she chose families (with 2 young children) having similar incomes.
- the families shopped at the same brand supermarket.
- spending was rounded to the nearest dollar.
- data was rank ordered.

Rose's Data

Wellington weekly food bill (\$S)

66, 68, 75, 78, 82, 84, 86, 87, 88, 90, 92, 94, 96, 100, 104, 108, 110, 116, 120, 124, 128, 130, 136, 142, 145, 152

Whangarei weekly food bill (\$S)

48, 52, 56, 58, 60, 62, 64, 66, 74, 76, 78, 86, 88, 91, 95, 98, 98, 102, 105, 108, 110, 116, 118, 120, 125, 125

16. Write a statistical question, which involves comparing the two sets of data.

End of Section

17. Sam wanted to find three consecutive even numbers that add up to 84. He wrote the equation $k + (k + 2) + (k + 4) = 84$. What does the letter k represent?

- The least of the three even numbers
- The middle even number
- The greatest of the three even numbers
- The average of the three even numbers

18. A farming advisor has information about the number of pigs, sheep and cattle in her local region, and for the whole of New Zealand. She is keen to know how her region is performing in terms of stock numbers. Write a statistical question suitable for her investigation.

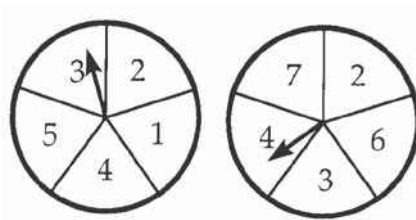
19. The following numbers have to be arranged in order from smallest to largest.

- A, 6.87×10^{-4}
- B, 9.2×10^{-5}
- C, 8.14×10^{-4}
- D, 7.2×10^{-5}

The correct order is:

- A, D, C, B
- B, D, C, A
- A, C, D, B
- D, B, A, C

20. The two spinners below are used for a maths game. Each arrow has an equal chance of landing on any one number on its spinner.
Which of these fractions expresses the probability of the spinners showing two even numbers?



- $\frac{5}{25}$
- $\frac{6}{25}$
- $\frac{10}{25}$
- $\frac{19}{25}$

21. For a linear graph of the form $y = mx + c$ the effect of increasing the value of m is to

- translate the graph.
- increase the rate of change of y with c .
- increase the rate of change of y with x .
- increase the intercept with the y axis.

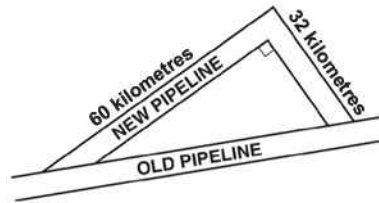
22. The table shows the values of x and y , where y is proportional to x .
What are the values of P and Q ?

x	3	6	P
y	7	Q	35

- $P = 10$ and $Q = 14$
- $P = 10$ and $Q = 31$
- $P = 14$ and $Q = 15$
- $P = 15$ and $Q = 14$

23. A new pipeline is being constructed to re-route its oil flow around the exterior of a national wildlife reserve. The plan showing the old pipeline and the new route is shown below.

About how many extra kilometres will the oil flow once the new route is established?



- 24
- 68
- 92
- 160

24. A laboratory has a 75 gram sample of radioactive material. The half-life of the material is 10 days. (This means that it takes 10 days for half of the initial mass to decay).

The formula below can be used to find m , the remaining mass in grams, in terms of t , the number of **10-day intervals** that mass has been decaying.

$$m = 75(0.5)^t$$

Based on the formula, what is the mass of the laboratory's sample remaining after 30 days?

- 9.375 grams
- 11.25 grams
- 12.5 grams
- 22.5 grams

25. Rounded to the nearest 10 kg the mass of a dolphin was reported as 170 kg. Select the weight range that includes all possible weights for the dolphin.

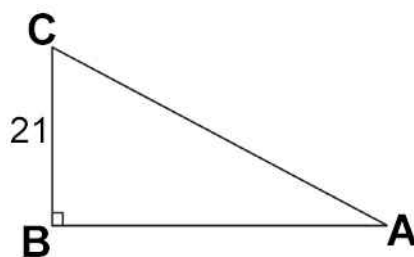


- $165\text{kg} \leq d < 175\text{kg}$
- $165\text{kg} \leq d < 174\text{kg}$
- $165\text{kg} < d < 174\text{ kg}$
- $165\text{kg} < d < 175\text{kg}$

26. Simplify: $-10 + 2(4 + w)$

- $-32 - 8w$
- $-18 + 2w$
- $-2 + w$
- $-2 + 2w$

27. In the figure below, $\sin A = 0.7$. What is the length of AC?



- 14.7
- 21.7
- 30
- 32

28. What is the factored form of $3a^2 - 24ab + 48b^2$?

- $(3a - 8b)(a - 6b)$
- $(3a - 16b)(a - 3b)$
- $3(a - 4b)(a - 4b)$
- $3(a - 8b)(a - 8b)$

Use the following information to answer question 29..

Rhonda wants to know how much soil she will have to remove to install a circular swimming pool in her garden. The pool will have a diameter of approximately 4 metres and an average depth of about 1.5 metres. She used π on her calculator and worked out that it would require 18.84956 cubic metres of soil to be removed.

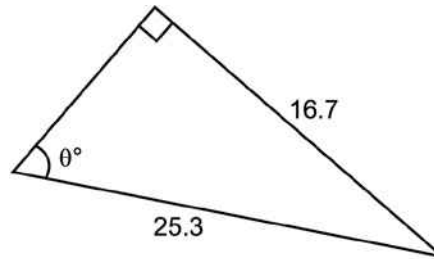
29. What would have been a sensible approximation she could have made during her calculations?

.....
End of Section

30. Dan baked some cookies. Sam took half of the cookies. Then Sue took half of the remaining cookies. Later, Lisa took half of the cookies that were left. When Dan came home, he saw only three cookies.

How many cookies did Dan bake altogether?

31. The value of θ , correct to one decimal place, is:



- 41.3
- 55.6
- 48.7
- 33.4

Use the following information to answer question 32..

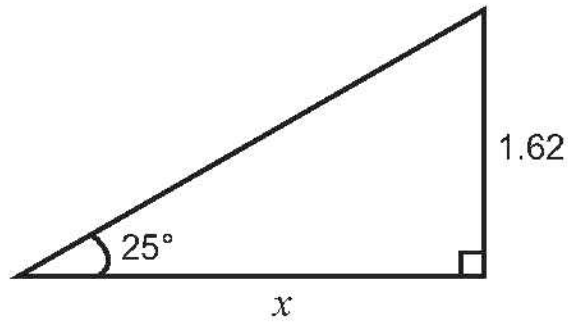
The table shows a comparison of marks of Maths and English in 10Mt's end of year exams.

	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
Maths	12	36	46	58	76
English	24	32	48	61	82

32. Why is it **NOT** possible to tell from the data the total marks gained by each class?

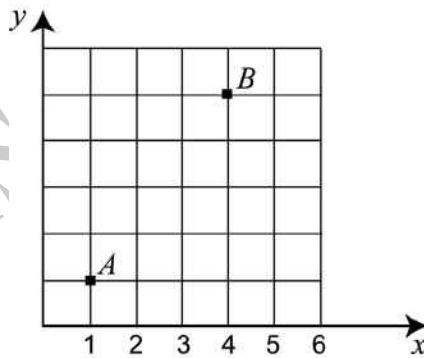
End of Section

33. The value of x , correct to 2 decimal places, is:



- 3.43
- 3.83
- 1.79
- 3.47
- 0.74

34. Two points, A and B , are located on the grid below. What is the distance between A and B ?



- $3\sqrt{2}$ units
- $4\sqrt{2}$ units
- 5 units
- 6 units

35. If the equation $y = 2^x$ is graphed, which of the following values of x would produce a point closest to the x -axis?

$\frac{1}{4}$

$\frac{3}{4}$

$\frac{5}{3}$

$\frac{8}{3}$

36. Which equation is equivalent to $5x - 2(7x + 1) = 14x$?

$-9x - 2 = 14x$

$-9x + 1 = 14x$

$-9x + 2 = 14x$

$12x - 1 = 14x$

37. $(2 + m) - (7 - 4m)$ is equal to

$-5 - 3m$

$-5 + 5m$

$9 - 3m$

$9 + 5m$

38. Juan has a bag containing 3 red, 2 blue, and 5 green marbles. He removes 1 marble from the bag, sets it aside, and draws another marble.

What is the probability that he draws a red marble followed by a blue marble?

- $\frac{2}{9}$
- $\frac{2}{10}$
- $\frac{3}{10}$
- $\frac{1}{15}$

39. Monica wants to earn an 'A' in mathematics.

- An 'A' requires an average greater than or equal to 92%
- The final project is 20% of the grade.

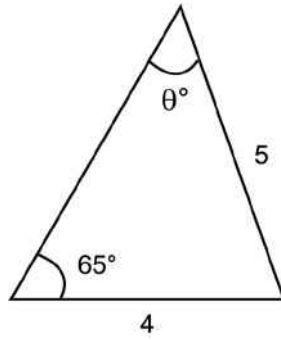
If Monica has an average of 95%, what is the lowest possible score she can earn on the final project and still earn an 'A'?

- 75%
- 80%
- 86%
- 92%

40. The Thomas family is travelling from Takaka to Christchurch, a distance of 489 kilometres. Their car has a fuel consumption of 8.12 litres per 100 kilometres. They have to pay \$1.06 a litre for petrol.

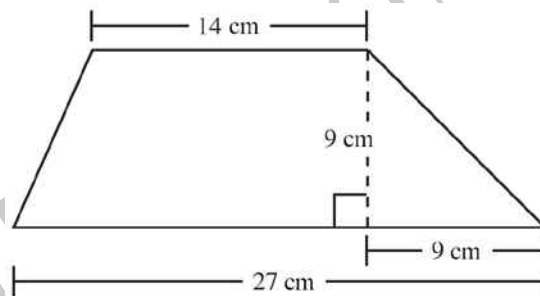
Find the cost of petrol for this journey.

41. Which statement is **TRUE** for the given triangle?



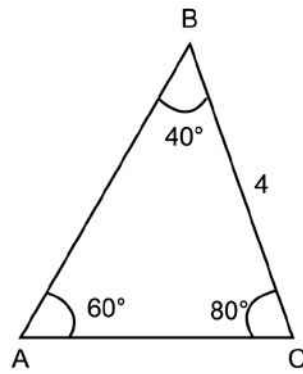
- $\sin \theta = \frac{4 \sin 65}{5}$
- $\sin \theta = \frac{5 \sin 65}{4}$
- $\sin \theta = \frac{4}{5 \sin 65}$
- $\sin \theta = \frac{4}{4 \sin 65}$

42. The trapezium pictured below has the measurements shown. Which measure is closest to the perimeter of the trapezium?



- 41 cm
- 59 cm
- 64 cm
- 66 cm

43. Which statement is **TRUE** for the given triangle?



$\frac{AC}{\sin 60} = \frac{4}{\sin 40}$

$\frac{BA}{\sin 80} = \frac{4}{\sin 40}$

$\frac{AC}{\sin 80} = \frac{4}{\sin 60}$

$\frac{AC}{\sin 40} = \frac{4}{\sin 60}$

44. The Year 13 class plans to sell T-shirts with the school's name on them. The cost of each T-shirt alone is \$3.50, and the printing cost of each is \$0.75. If the class plans on selling each printed T-shirt for \$11, what expression can you use to calculate the class profit for selling n printed T-shirts?

$11.00 - (3.50 + 0.75)n$

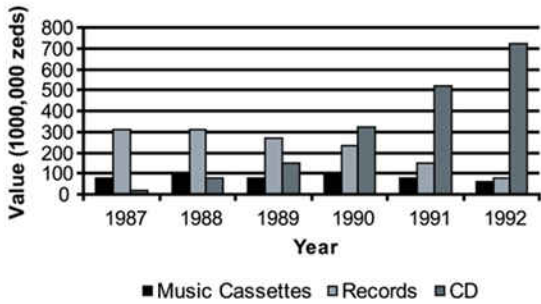
$11.00n - (3.50 + 0.75)$

$11.00 - 3.50 - 0.75n$

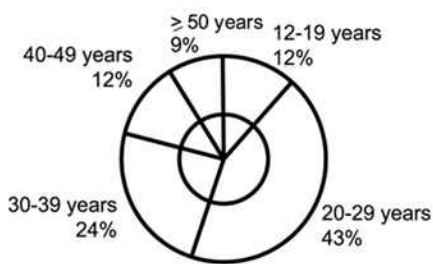
$(11.00 - 3.50 - 0.75)n$

45. The graphs give information about sales of CDs and other sound recording media in Zedland. Zeds are the monetary units used in Zedland.

Value of various sound recording media sold in Zedland (millions of Zeds)



CD sales according to age in 1992



With the aid of both graphs calculate how much money was spent by 12 - 19 year olds on CDs in 1992.

46. The graph of $y = 2x^2$ is:

- Wider than $y = x^2$
- Narrower than $y = x^2$
- The same width as $y = x^2$
- A reflection of $y = x^2$ in the y axis
- The same graph as $y = x^2$

47. Which of the following **MOST** accurately describes the translation of the graph $y = (x + 3)^2 - 2$ to the graph of $y = (x - 2)^2 + 2$?

- Up 4 and 5 to the right
- Down 2 and 2 to the right
- Down 2 and 3 to the left
- Up 4 and 2 to the left

48. After conducting an experiment to test a hypothesis they proposed, a pair of students concluded that the hypothesis was incorrect. Assuming that their data are correct, which of the following would be the **LEAST** appropriate response for their teacher to make to them?

- Encouragement, because they have discovered evidence that casts doubt on a plausible hypothesis.
- A recommendation that they reformulate their hypothesis with the new data in mind.
- A suggestion that the students repeat the experiment to check their results.
- An explanation of what the students did wrong.

Please provide these instructions to all staff involved with administering e-asTTle online.

Before the testing session

1. Make sure students have the right devices and browsers installed

Unsupported devices may result in the test not displaying correctly and affect students' scores.

Desktop/Laptop

- Windows, Mac or Chromebook
- Minimum window width: 1280 pixels
- Windows devices need up-to-date Edge, Chrome, Firefox or IE11
- Windows tablets/hybrids e.g., Surface Pro must have a keyboard attached
- Mac devices need recent Chrome or Safari

Large Tablets (9" +)

- iPads: iOS 10+ with Safari
- Androids: Large tablet e.g., Samsung Galaxy Tab 4. Must have Android 5+ and latest Chrome
- Minimum window width: 768 pixels

iPad Minis and small Androids must not be used.

More information on device requirements and the underlying rationale is available on the [help site](#).

2. Sit the Practice Test

[A practice test for each subject](#) is available. These are also available in the Student Portal (no login required). Practice tests are designed to familiarise you and your students with e-asTTle online before sitting a real test. Each practice test contains attitude questions, look-over time and 5-8 questions designed to be relatively simple to answer. [Teacher scripts](#) are available for practice tests.

3. Ensure you have student login information

More information on accessing student logins and resetting passwords is available on the [help site](#).

4. Check if calculators are required (Maths/Pāngarau)

Tests with questions at mostly Level 5 and 6 require the use of calculators. Tests with questions at mostly Levels 2 to 4 do NOT require a calculator.

During the testing session

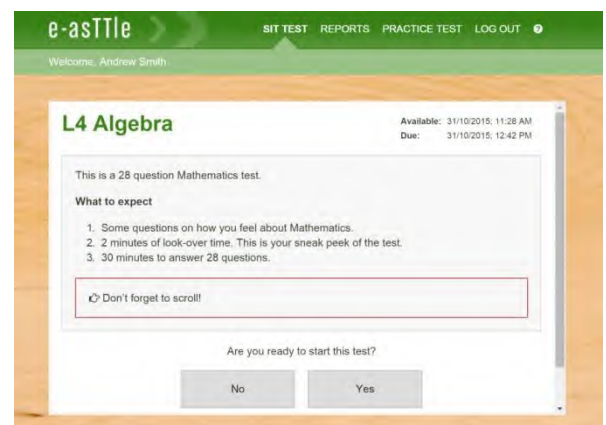
1. Check equipment

- Make sure students' devices are charged.
- Make sure students have scrap paper and a pen/pencil for working, calculators (if needed) and a quiet activity they can continue with if they finish early.

2. Read the Test Details to students

Once students select a test, they will see the test details page (example shown on right).

Read through this page aloud with your students.



Other reminders to discuss with students:

- Once they choose 'Yes', the timer starts. Once the timer is counting down, there is no way to pause the test. If students close the test accidentally, they can re-open it again, provided the timer hasn't finished.
- Ask students to raise their hand if something seems wrong.
- Fullscreen mode is recommended.

For students on iPad or Android tablet devices: remind them to lock their device in portrait mode.

For students on Windows hybrid devices (such as the Surface Pro): remind them to keep the keyboard attached during the test.

3. Supervising the test

Make sure you walk around and monitor students during the test. Students tend to continue with their test even if something has gone wrong – for example, a question does not display correctly. For this reason, check that pages are loading correctly, and students are scrolling to see all the content and options. It's a good idea to have a paper booklet of the test available during the testing session.

Students are generally expected to read the test content without assistance. Information on accommodations (e.g., reader-writers) is available on the [help site](#).

4. Know what to do if things go wrong


Internet disconnected

If student answers aren't saving, e-asTTle will show a yellow banner at the top of the page. The banner will turn red when there has been disconnection for 2 minutes or more. Students can keep answering whatever they can, and e-asTTle will try and save answers. Don't refresh or close the window if a coloured banner is showing.



If the Internet has been down, use your professional judgement to decide if students' results should be [excluded](#).

Images not loading

If an image is missing, students will see an icon they can click to try and reload the image.  **INFO MISSING**
[Click to reload](#)

A question doesn't load fully or looks strange

If something has loaded incorrectly, it can sometimes be corrected by selecting the 'Next' button then the 'Previous' button to reload the question.

Detailed troubleshooting information is available on the [help site](#). To report issues with online testing or for additional assistance, please contact the Education Service Desk: 0800 225 5428.