

Summary

Test Identification

Name	2020 MAT SW 3.5
Date Created	15 Oct 2020
Date Modified	25 Nov 2020
Subject	Mathematics
Status	SCORED
Sequence Number	1073493
Total Test Time	57 minutes
Delivery Method	Onscreen

Curriculum Strand

Number Sense & Operations	11	Number Knowledge	11
Statistics	11	Algebra	11

Curriculum Level

4B	2	4P	0	4A	3
5B	7	5P	15	5A	10
6B	1	6P	4	6A	2

Cognitive Processing

Surface	19	Deep	25
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Slider Settings

Strands		Level	
Number Knowledge	Most	Level 4	Few
Number Sense & Operations	Most	Level 5	Most
Algebra	Most	Level 6	Few
Statistics	Most		

Marking Guide : 2020 MAT SW 3.5

Q.No	Marking Key
1	d
2	c
3	3
4	30
5	22
6	2048.8
7	a
8	c
9	b
10	c
11	c
12	a
13	b
14	c
15	b
16	b
17	d
18	any of: 153,156,159,162,165,168,171,174,177,180,183,186,189,192,195,198 'any of the above for 1 mark'
19	Any of these: 160, 170, 180, 190 'Need only one of these for 1 mark'
20	180 '150 is not acceptable'
21	Not possible. A prime number cannot be divisible by 3 (or similar) 'need equivalent explanation to get 1 mark'
22	d
23	b
24	b
25	a
26	c
27	b
28	b

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
<u>29</u>	Maria, explanation such as: To get the biggest difference, one needs the biggest poss number on top in the 100ths place, with the smallest poss number on the bottom; Carla"s answer will be less than 100 and Maria"s answer at least 194 'Or equivalent explanation'
<u>30</u>	b
<u>31</u>	b
<u>32</u>	d
<u>33</u>	c
<u>34</u>	a
<u>35</u>	c
<u>36</u>	3, 5, 4, 1, 2 'all in order for one mark'
<u>37</u>	c
<u>38</u>	$x - 2$
<u>39</u>	This is a golfer who needs relatively little practice to get a reasonable (average) score, or equivalent. 'Must have both variables (practice and score/performance) in answer'
<u>40</u>	We would expect some variation from the expected values 'Any sensibly reasoned equivalent argument'
<u>41</u>	a
<u>42</u>	24 Adults, 8 Children 'Both required for 1 mark.'
<u>43</u>	$-4xy(2x-3y+1)$ or $4xy(-2x+3y-1)$ (or equivalent)
<u>44</u>	40L, \$40

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 think maths is exciting and interesting.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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02. I never get tired of doing maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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03. I like to do and think about maths outside of school.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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04. I think maths helps me to understand life.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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05. I think that maths helps people make important decisions.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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06. Maths is NOT boring.

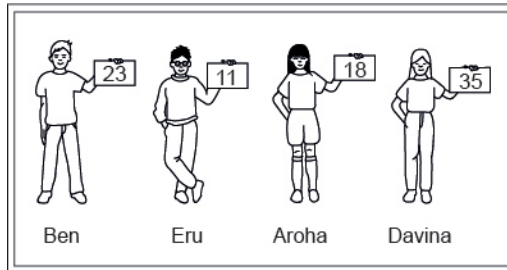
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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ADMINISTER ON SCREEN ONLY

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?

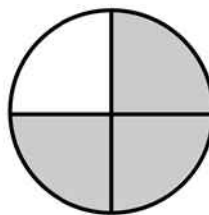


- Ben
- Eru
- Aroha
- Davina

P02. Complete this number pattern.

2, 4, _____, _____, 10

P03. What fraction of this circle is shaded?

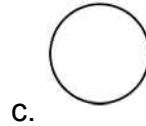
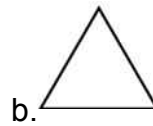




P04. Match the sentence with the correct shape.

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. What digit goes in the space to make the number sentence below **TRUE**?

$$1.6238 < 1.\underline{\quad}017$$

- 4
- 5
- 6
- 7

02. Paige was asked to round 325 672 to the thousands place.

Which number below shows the correct value?

- 325 000
- 325 700
- 326 000
- 326 670

Use the following information to answer questions 03 to 05.

Below is a stem-and-leaf graph showing the results of a spelling test.

Only Melanie got them all correct.

3		0																	
2		0	1	2	2	2	2	4	4	5	6	6	8	9					
1		0	2	4	5	5	6	6	7	7	7	8	9	9					
0		8	9																

03. How many students scored less than 12?

04. What mark did Melanie get?

05. Which mark scored **MOST** frequently?

End of Section

06. Write the answer to this number sentence.

$5024.6 - 2975.8 =$ _____

07. Josh rounded the number 36 796 to the nearest ten, to the nearest hundred, to the nearest thousand, and to the nearest ten-thousand.

Which two roundings should have produced the same number?

- nearest ten and nearest hundred
- nearest hundred and nearest thousand
- nearest ten and nearest thousand
- nearest hundred and nearest ten-thousand

08. Which of these is 89.0638 rounded to the nearest hundredth?

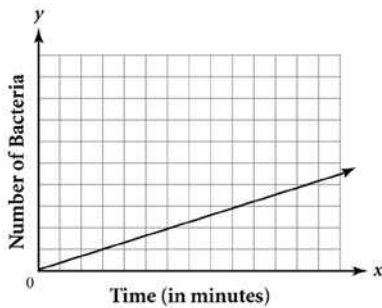
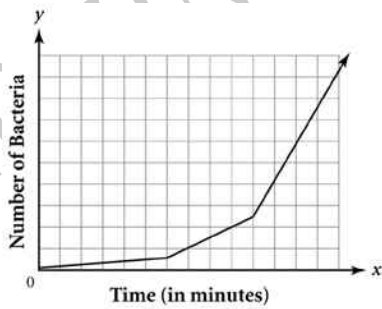
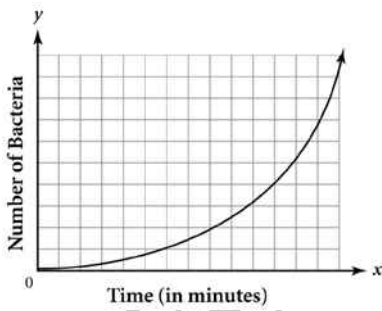
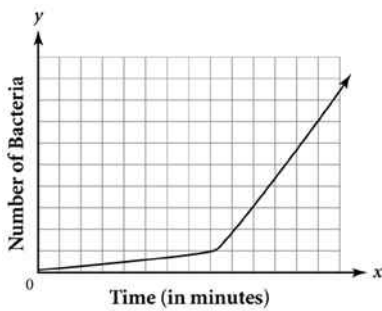
- 100
- 89.1
- 89.06
- 89.064

09. The table shows the number of bacteria present at 30 minutes intervals during a science experiment.

Which of the graphs below **BEST** shows the relationship between time and the number of bacteria present?

Number of Bacteria Over Time

Time (in minutes)	Number of Bacteria
0	3
30	6
60	12
90	24
120	48
150	96
180	192
210	384



PREP ONLINE ONLY

10. Sue has three more dollars than John and together they have \$24.50.
Which of these equations could you use to find the amount of money John has?
(j = the amount of money John has)

- $j + (3 \times j) = \$24.50$
- $2 \times (j + 3) = \$24.50$
- $j + (j + 3) = \$24.50$
- $3 \times j = \$24.50 + j$

11. From a batch of 3000 light bulbs, 100 were selected at random and tested. 5 of the light bulbs in the sample were found to be defective.
How many defective light bulbs would be expected in the entire batch?

- 15
- 60
- 150
- 300
- 600

12. Which of the following lists the numbers in order from least to greatest?

- 17.3 % , 17.33, $17\frac{1}{3}$, 17.34
- 17.33, $17\frac{1}{3}$, 17.3 % , 17.34
- 17.34, 17.33, $17\frac{1}{3}$, 17.3 %
- 17.3 % , 17.33, 17.34, $17\frac{1}{3}$

13. The number of goals scored by the College First XI soccer team in their matches last season was 8, 4, 2, 6, 3, 3, 9, 3 and 7.
What was their *median* score?

- 3
- 4
- 5
- 7

14. Which is closest to 2×9^5 ?

- 1000
- 10 000
- 100 000
- 1 000 000

15. $\frac{2}{5} + \frac{7}{15}$ is equal to

- $\frac{9}{20}$
- $\frac{13}{15}$
- $\frac{9}{15}$
- $\frac{14}{75}$

ADMINISTER ON SCREEN ONLY

16. If the price of a can of beans is raised from 50 cents to 60 cents, what is the percent increase in the price?

- 83.3%
- 20%
- 18.2%
- 16.7%
- 10%

17. If the pattern in the table continues, which of the following expressions represents t ?

n	1	2	3	4	5	6
t	0	3	8	15	24	35

- $2n - 1$
- $(n - 1)^2$
- $3(n - 1)$
- $n^2 - 1$

Use the following information to answer questions 18 to 21

Terri and Nicholas invented a new game called Mix and Match Clues. These are the clues:

Clue A: The number is greater than 150 and less than 200.

Clue B: The number is evenly divisible by 3.

Clue C: The number is evenly divisible by 5.

Clue D: The number is evenly divisible by 2.

Clue E: The number is a prime number.

18. If possible, write a number that fits Clues A and B. If not possible, tell why.

19. If possible, write a number that fits Clues A, C, and D. If it is not possible, tell why.

20. If possible, write a number that fits Clues, A, B, C, and D. If it is not possible, tell why.

21. If possible, write a number that fits Clues, A, B, and E. If it is not possible, tell why.

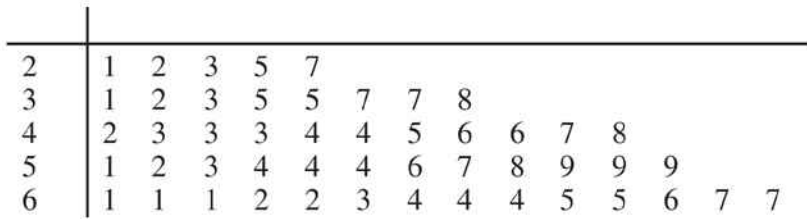
End of Section

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22. The stem-and-leaf plot below shows the ages of 50 teachers in the Bernard Township school system.

Based on the stem-and-leaf plot, what percent of the teachers are over 50 years of age?

Ages of 50 Teachers in the Bernard Township School System



Key
6 1 = 61

- 26%
- 47%
- 51%
- 52%

23. In a certain forest, there are approximately 3 aspen trees for every 2 spruce trees.

Forest rangers estimate that the forest contains about 300 000 trees that are either aspen or spruce.

Which of the following is closest to the number of spruce trees in the forest?

- 60 000
- 120 000
- 180 000
- 240 000

24. A student conducted a study of the salinity (salt content) of the water in a salt marsh. The table below shows the salinity in parts per thousand (ppt) that the student measured on the first day of each month. Based on the data in the table what was the mean increase per month of the salinity?

Salinity of Salt Marsh Water

Date	Salinity (ppt)
March 1	12
April 1	14
May 1	15
June 1	17
July 1	20
August 1	24
September 1	29
October 1	33

- 2 ppt
- 3 ppt
- 4 ppt
- 5 ppt

25. Which expression is equivalent to $7^5 \times 7^{10}$?

- 7^{15}
- 7^{50}
- 49^{15}
- 49^{50}

Use the following information to answer question 26..

Louise records the number of goals she scores in each soccer match. Her results are shown in this table.

Number of goals	Number of matches
0	4
1	2
2	3
3	0
4	1

26. In how many matches did Louise score **at least** 2 goals?

- 1
- 3
- 4
- 9

End of Section

27. Which point on the number line represents a number that has a square root greater than itself.



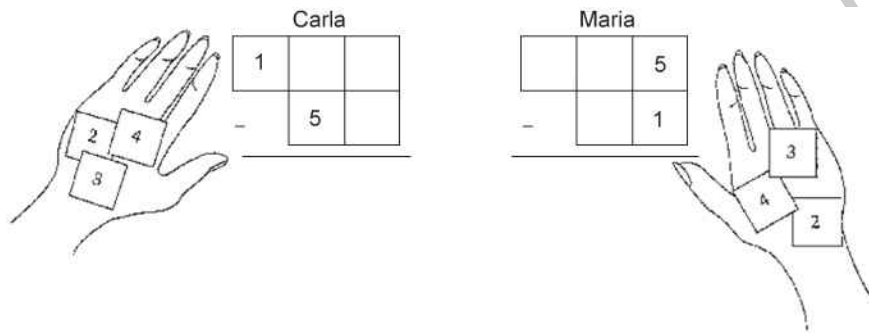
- A
- B
- C
- D

28. The total cost (c) in dollars of renting a sailboat for n days is given by the equation $c = 120 + 60n$.

If the total cost was \$360, for how many days was the sailboat rented?

- 2
- 4
- 6
- 8

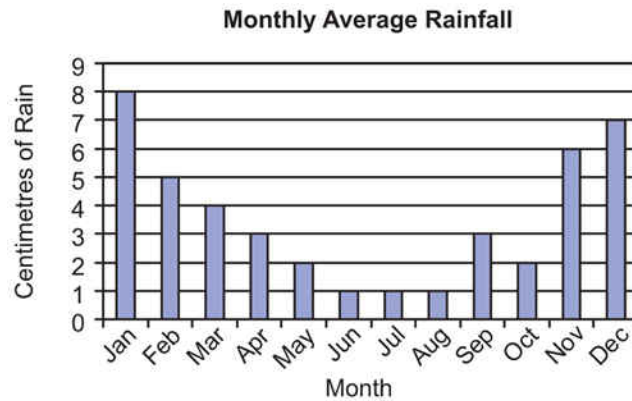
29. In a game, Carla and Maria are making subtraction problems using tiles numbered 1 to 5. The player whose subtraction problem gives the largest answer wins the game. Look at where each girl placed two of her tiles.



Who will win the game? _____

Explain how you know this person will win.

30. According to the graph, what is the median of the monthly average rainfall?



- 1 cm
- 3 cm
- 4 cm
- 7 cm

31. Jerry attended a computer software conference.

- He paid \$12.00 for admission.
- He spent \$11.50 for lunch.
- He paid \$1.50 for each workshop ticket.

If Jerry had a total of \$35.00 to spend at the conference, which of the following inequalities could be used to determine n , the maximum number of workshop tickets that Jerry could have purchased?

- $1.50n \leq 35.00$
- $12.00 + 11.50 + 1.50n \leq 35.00$
- $35.00 + 1.50n \leq 12.00 + 11.50$
- $12.00 + 11.50 + 1.50 \leq 35.00n$

32. Ms Thierry and 3 friends ate dinner at a restaurant. The bill was \$67. In addition, they left a \$13 tip.

Approximately what percent of the total bill did they leave as a tip?

- 10%
- 13%
- 15%
- 20%
- 25%

33. For the set of values, determine which of the following statements is **TRUE**.

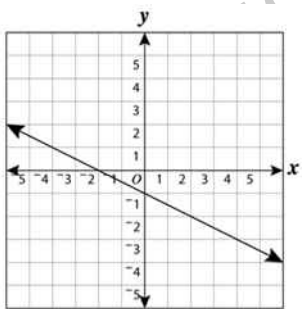
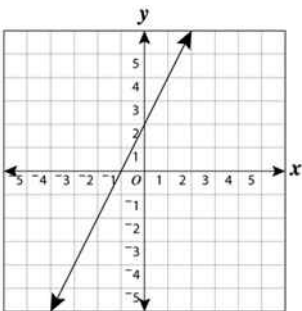
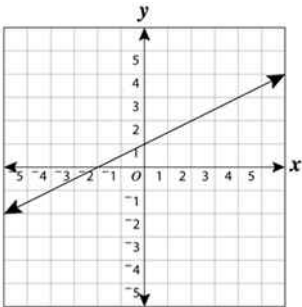
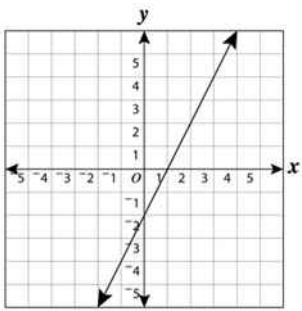
{ 25, 32, 38, 38, 42, 45, 46, 54 }

- i. The median of the set is 40
- ii. The mean of the set is 40
- iii. The mode of the set is 40

- i only
- ii only
- i and ii only
- ii and iii only

ADMINISTER ON SCREEN ONLY

34. Which graph corresponds to $y = 2x - 2$?



ANSWER ONLY

35. Audrey is given the following problem to solve.
 Audrey has to solve for a and b .
 Which of the following is **NOT** possible?

$$\begin{array}{r} aba \\ + ab \\ \hline a77 \end{array}$$

- b is odd and greater than a
- a is even and smaller than 5
- a and b are both odd numbers
- a and b are both prime numbers

36. Put the numbers 1, 2, 3, 4 and 5 in the boxes to order the following fractions from the highest (1) to the lowest (5).

- $\frac{3}{4}$
- $\frac{3}{5}$
- $\frac{4}{6}$
- $\frac{7}{8}$
- $\frac{8}{10}$

37. In statistics, which of the words below **BEST** describes discrete data?

- Measured
- Continuous
- Countable
- Average

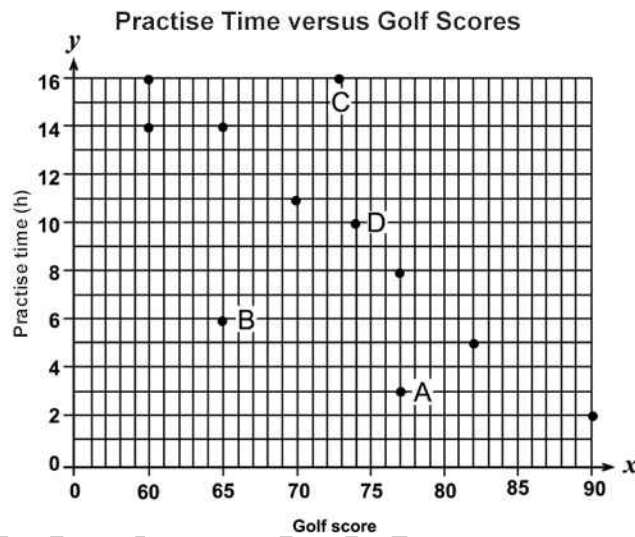
38. The area of a rectangle in square centimetres is represented by the expression $x^2 + 2x - 8$.

The length of the rectangle is $x + 4$ centimetres.

What is an expression for the width of the rectangle in centimetres?

Use the following information to answer question 39..

The graph below shows the number of hours practised by golfers during the week before they play in a tournament.



39. Give a reason for the outlier labelled A.

End of Section

40. Two four-sided dice were rolled 63 times and the sum recorded below.

sum	2	3	4	5	6	7	8
frequency	9	9	9	9	9	9	9

Explain why this frequency distribution is unlikely.

41. The sonar system of a submarine receives an echo back from a ship 5000 metres away after 6.1 seconds. It picks up an echo from a second ship after 8.4 seconds. Which proportion **could** be used to find the distance to the second ship?

- $\frac{6.1}{5000} = \frac{8.4}{x}$
- $\frac{6.1}{8.4} = \frac{x}{5000}$
- $\frac{8.4 - 6.1}{8.4} = \frac{x}{5000}$
- $\frac{2.3}{5000} = \frac{6.1}{x}$

Use the following information to answer question 42..

A ferry earns \$320 carrying 32 passengers. Children are charged \$4 and adults \$12.

Let x = number of children and y = number of adults.

42. Use simultaneous equations to work out the number of adults and children crossing the river.

Adults: _____

Children: _____

.....
End of Section

43. Fully factorise

$$-8x^2y + 12xy^2 - 4xy$$

44. 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.

Estimate the amount of petrol they will use for this journey. _____

Estimate the cost of petrol for this journey. _____

ADMINISTER ONLY SCREEN

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

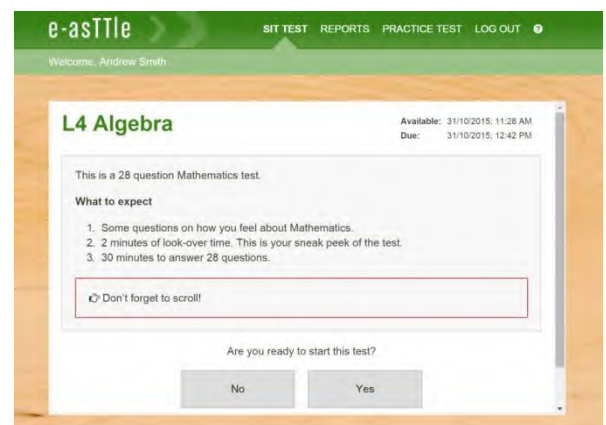
1. Check equipment

- 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.