

Summary

Test Identification

Name	2019 MAT SW 2.6
Date Created	20 May 2019
Date Modified	14 Jun 2019
Subject	Mathematics
Status	SCORED
Sequence Number	924727
Total Test Time	57 minutes
Delivery Method	Onscreen

Curriculum Strand

Number Sense & Operations	12	Statistics	12
Algebra	13		

Curriculum Level

5B	1	5P	5	5A	6
6B	11	6P	15	6A	9

Cognitive Processing

Surface	14	Deep	34
----------------	----	-------------	----

Slider Settings

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

Marking Guide : 2019 MAT SW 2.6

Q.No	Marking Key
1	b
2	d
3	b
4	c
5	d
6	b
7	c
8	c
9	b
10	c
11	b
12	b
13	45
14	Whether students have eaten - a record should be kept of what the students ate. OR Prior level of fitness. 'Accept any sensible problem that could occur between the 2nd and 3rd measuring that could affect the 3rd measurement. Do not accept "eating raises the metabolic rate" type of response'
15	-1.7
16	d
17	\$73
18	c
19	b
20	b
21	d
22	83 or 83.3
23	c
24	c
25	c
26	b
27	d
28	a
29	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 (-).

Q.No	Marking Key
<u>30</u>	How much extra power are we using this month compared with the same month last year? Or similar/equivalent 'Could use words like "compare" or "explore" or "relationship" to indicate a suitable investigation'
<u>31</u>	We would expect some variation from the expected values 'Any sensibly reasoned equivalent argument'
<u>32</u>	Both scales should start at zero.
<u>33</u>	Exaggerates gradient, or skips the first 80 shirts and makes an increase of 5 look bigger, or looks like Pat had few/lots sales, or similar suitable explanation
<u>34</u>	There is a negative correlation; or, a few people have won a lot, or, the number of winners is inversely related to the prize money - or similar
<u>35</u>	$(x + 6)(x + 10) = 100$ or $x^2 + 16x - 40 = 0$ or equivalent
<u>36</u>	c
<u>37</u>	a
<u>38</u>	c
<u>39</u>	a
<u>40</u>	c
<u>41</u>	Darlene: Town A grew by 60% and town B by 50% 'or equivalent'
<u>42</u>	d
<u>43</u>	d
<u>44</u>	40L, \$40
<u>45</u>	a
<u>46</u>	d
<u>47</u>	a
<u>48</u>	true, true, false 'All correct for 1 mark. (rational, rational, irrational)'

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
---------------------	----------------	--------------	-------------------

01. I like maths at school.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

02. I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

03. My teacher thinks I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

04. My Mum and Dad think I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

05. I enjoy doing maths in my own time (not at school).

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

06. I enjoy doing things in maths that I haven't tried before.

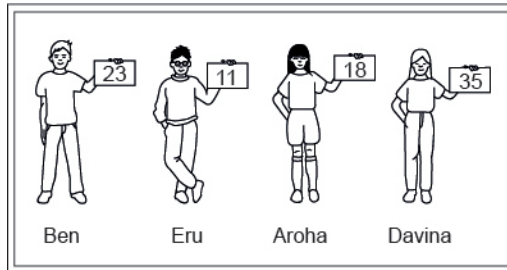
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

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?

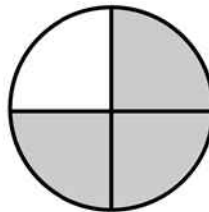


- Ben
- Eru
- Aroha
- Davina

P02. Complete this number pattern.

2, 4, _____, _____, 10

P03. What fraction of this circle is shaded?

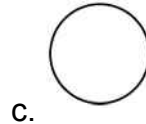
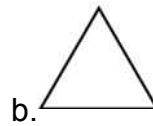




P04. Match the sentence with the correct shape.

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. The table below shows the number of blocks Susan walked each day last week. What was the mean (average) number of blocks she walked each day?

Mon.	Tues.	Wed.	Thur.	Fri.
21	18	15	18	13

- 15
- 17
- 18
- 21

02. Ground beef costs \$2.59 per kilogram. What is the cost of 0.93 kilograms of ground beef?

- \$3.52
- \$2.78
- \$2.47
- \$2.41
- \$1.66

03. Edgar earned the following scores on his first 10 science tests.
73, 86, 91, 87, 88, 79, 82, 93, 90, 86
Which of these will be affected if Edgar earns a score of 50 on his next test?

- Mean, median, and mode
- Mean and median
- Mean only
- Median only

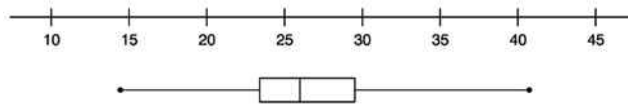
04. Which of the following numbers is closest to the value of the expression below?

$$5.1\left(\frac{4.8 \times 1021}{495}\right)$$

- 5000
- 500
- 50
- 5

05. The box-and-whisker graph shown below represents the results of a survey of the estimated petrol mileage of 100 car models.

Which statistics (mean, median, mode, range) can be determined from this graph?



- Mean only
- Median only
- Range and mean
- Range and median

06. $\left(\frac{2}{5}\right)^2$ is equal to

- $\frac{4}{5}$
- $\frac{4}{25}$
- $\frac{2}{25}$
- $\frac{4}{10}$

07. The stem-and-leaf plot shows the results of a science experiment in which 12 plants were each given a different combination of water and nutrients over a period of time and their growth in millimetres measured.
What was the median number of millimetres of growth?

Millimetres Growth

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

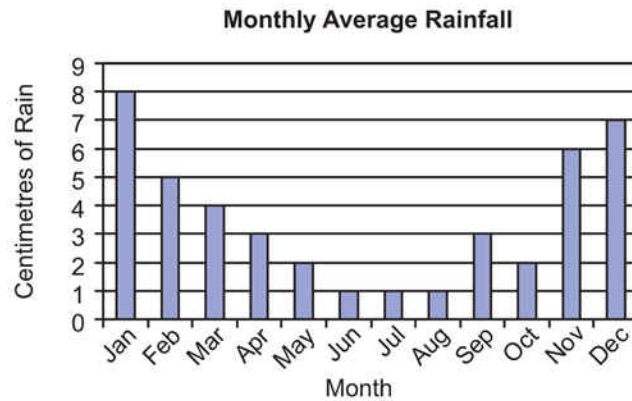
- 14
- 15
- 16
- 17

08. The price of a can of beans is raised from 60 cents to 75 cents.
What is the percent increase in the price?

- 15%
- 20%
- 25%
- 30%

ADMINISTER ONLY ON SCREEN

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



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

10. Which of the answers below is equivalent to $2\sqrt{12} + 3\sqrt{3}$?

- $16\frac{1}{2}$
- $5\sqrt{15}$
- $7\sqrt{3}$
- $7\sqrt{6}$

11. The expression below was used to approximate a distance in kilometres.

$$\sqrt{7^2 + 8^2}$$

Based on the expression, which of the following is **closest** to the distance?

- 10 kilometres
- 10.5 kilometres
- 11.5 kilometres
- 15 kilometres

12. What happens to the value of $\frac{1}{2x}$ as x gets smaller?

- Nothing
- It gets larger
- It gets smaller
- It changes to zero

13. Using the formula $A = \frac{PRT}{100}$

What is A when $P = 300$, $R = 5$ and $T = 3$?

$A =$ _____

Use the following information to answer question 14..

The students in Hemi's science class were investigating the claim that exercise raises a person's metabolic rate for as long as 12 hours. This enables fat to be burnt off after exercise has finished.

They were also told that eating raises the metabolic rate.

The students walked briskly on a treadmill for a fixed period of time and then measured their metabolic rate before, immediately after, and then 12 hours after the exercise.

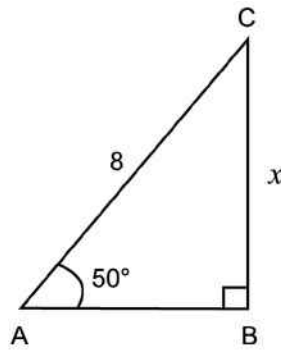
14. What is one factor that could lead to an invalid conclusion in this experiment?

End of Section

15. Calculate $\frac{3.5^2}{2.4 - 9.6}$

_____ (1dp)

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



- $x = 8 \cos 50$
- $x = \frac{8}{\sin 50}$
- $x = \frac{\tan 50}{8}$
- $x = 8 \sin 50$

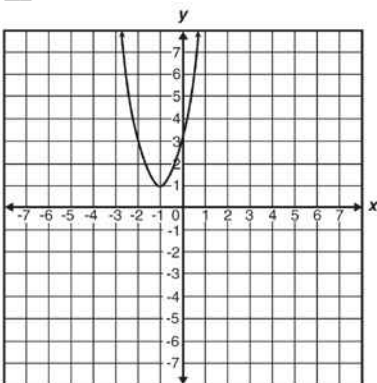
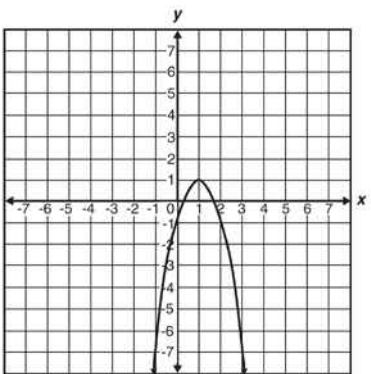
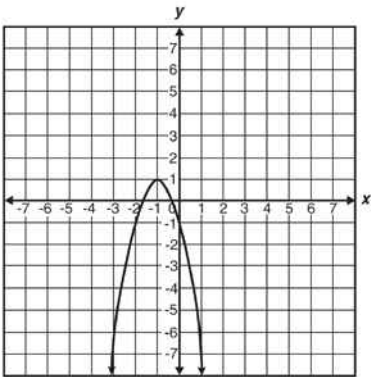
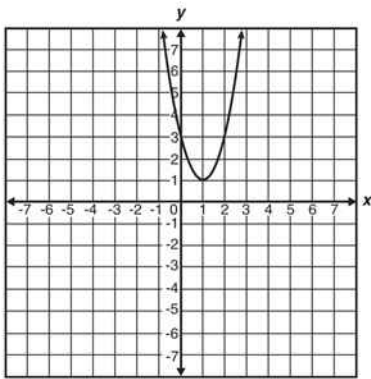
17. A circular spa pool holds 4500 litres of water.
It costs 12.45 cents to raise the temperature of 100 litres of water by 1°C.



Calculate the cost (to the nearest dollar) of heating the spa pool from 15°C to 28°C.

\$ _____

18. Which is the graph of $y = -2(x - 1)^2 + 1$?



ANSWER ONLY ON SCREEN ONLY

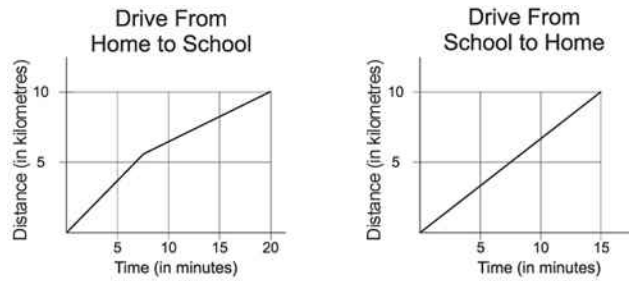
19. What is the slope of the line defined by the equation shown below?

$$5x + 2y = 10$$

- $-\frac{2}{5}$
- $-\frac{5}{2}$
- $\frac{5}{2}$
- $\frac{2}{5}$

20. The two graphs below show Carol's drive from home to school and from school to home.

What is the difference in her average speed in kilometres per hour for the two trips?



- 5 kph
- 10 kph
- 15 kph
- 20 kph

21. The perimeters of two squares are in a ratio of 4 to 9.

What is the ratio between the area of the two squares?

- 2 to 3
- 4 to 9
- 16 to 27
- 16 to 81

22. Five out of the 30 days in June had rain.

What percentage of the days did **NOT** have rain?

_____ %

23. The table below reflects the number of different handshakes (H) for groups of n relatives.

For any size gathering of people, which formula gives the correct number of handshakes for n people?

n	7	8	12	20
H	21	28	66	190

$H = \frac{n(n+1)}{2}$

$H = \frac{(n-1)^2}{2}$

$H = \frac{n(n-1)}{2}$

$H = \frac{n^2+1}{2}$

24. Samantha tosses two 20c coins and three 10c coins.

What is the probability that both 20c coins and at least one of the 10c coins will land heads up?

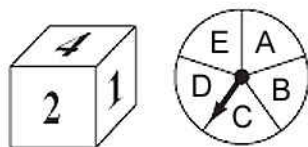
$\frac{1}{32}$

$\frac{3}{32}$

$\frac{7}{32}$

$\frac{21}{32}$

25. A number cube with faces numbered 1 through 6 will be tossed once, and the arrow on a spinner with equally sized regions labeled A through E will be spun at the same time. What is the probability that the number facing up on the cube will be less than 3 and the arrow will land on a region labeled A or E?



- $\frac{17}{30}$
- $\frac{3}{11}$
- $\frac{2}{15}$
- $\frac{1}{15}$

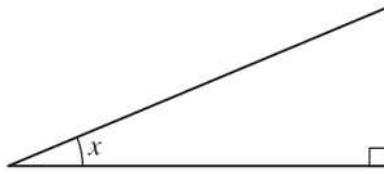
26. Tina solved a quadratic equation and found the solutions to be $-\frac{3}{2}$ and 6. Which of the following is equivalent to the quadratic equation that Tina solved?

- $(x - 6)(3x + 2) = 0$
- $(x - 6)(2x + 3) = 0$
- $(x + 6)(2x - 3) = 0$
- $(x + 6)(3x - 2) = 0$

27. Which pair of equations shares a solution?

- $5x + 2 = 32$
 $2x + 3 = 8 + x$
- $5x + 2 = 32$
 $-3x + 4 = 2(x - 5)$
- $5x + 2 = 32$
 $x + 2(x - 4) = 34 - 3x$
- $5x + 2 = 32$
 $4x + 9 = 5(14 - x) - 7$

28. In the figure below, if $\sin x = \frac{5}{13}$, what are $\cos x$ and $\tan x$?



- $\cos x = \frac{12}{13}$ and $\tan x = \frac{5}{12}$
- $\cos x = \frac{12}{13}$ and $\tan x = \frac{12}{5}$
- $\cos x = \frac{13}{12}$ and $\tan x = \frac{5}{12}$
- $\cos x = \frac{13}{12}$ and $\tan x = \frac{13}{5}$

29. $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

- $3x^2 + x + 6$
- $3x^2 + x + 10$
- $3x^2 - 5x + 6$
- $3x^2 - 5x + 10$

30. The electricity company posts the monthly bill to each household. The bill shows the amount of power used that month, and the cost. It also shows the amount of power used in the same month the previous year. Write a suitable question to investigate the effect of an electricity saving campaign this year.

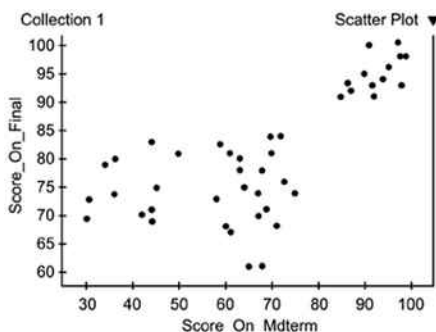
31. Two four-sided dice were rolled 63 times and the sum recorded below.

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

Explain why this frequency distribution is unlikely.

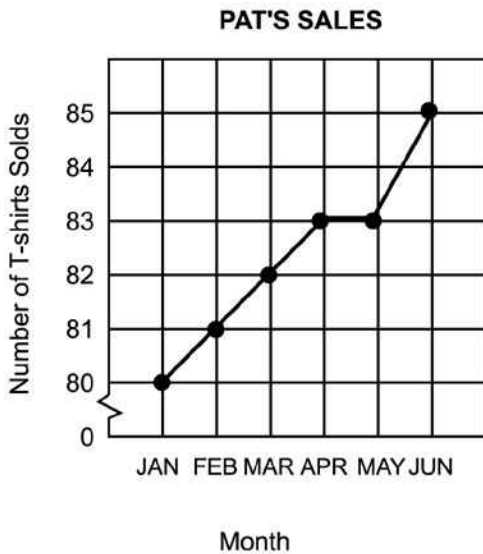
32. Extra study sessions were offered to students after the midterm test to help improve their understanding of statistics. Student scores on the midterm and final tests were recorded. The following scatter plot shows the final test scores against the midterm test scores.

The tutor concludes that students near the bottom and students near the top made the biggest improvement, but the study sessions has minimal effect on students near the middle.



What feature of the graph makes this a misleading conclusion?

33. Pat was planning to ask her boss for a raise. She made the graph below to show her boss the increase in her T-shirt sales.



Why does the break in the vertical axis make the graph misleading?

Use the following information to answer question 34..

The operators of a casino recorded the number of people playing jackpot type games and recorded their winnings.

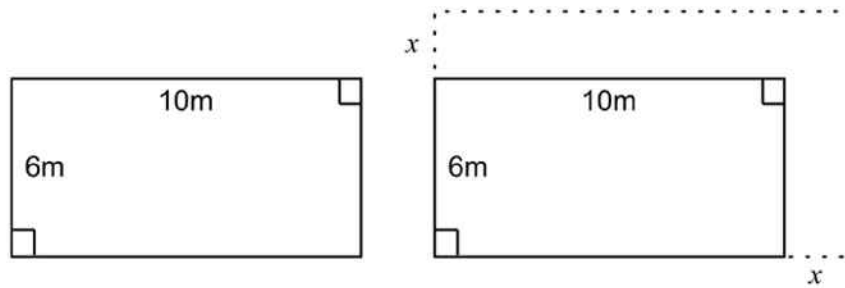
No of players	25	100	250	500	1000	5000	10000
Prize\$	5000	300	1000	500	100	50	10

34. What can you conclude about the relationship between the number of players and the prize money?

End of Section

Use the following information to answer question 35..

Pita wanted to make his garden bigger so he measured his garden and drew a plan.



He decided to add the same amount to both the length and the width. The garden now had an area of 100m^2 .

35. Write an equation to show how he could find x .

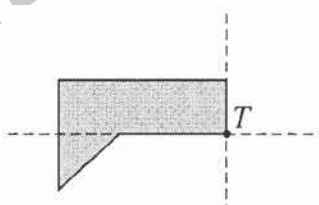
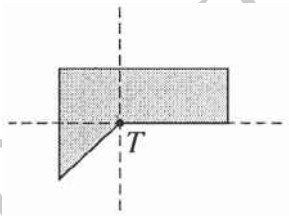
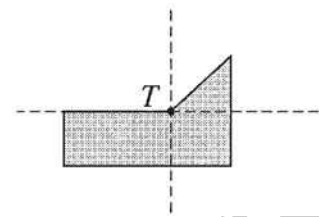
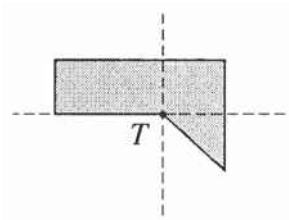
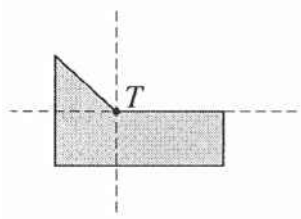
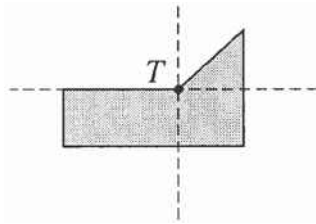
End of Section

36. Which of the following could be the lengths of the sides of a triangle?

- 1, 2, 1
- 2, 3, 1
- 3, 5, 4
- 7, 15, 7

37. A half-turn around point T followed by a reflection in the horizontal axis is applied to the shaded figure.

Which of these shows the result of the combined transformation?



ALL ANSWERS ON SCREEN ONLY

38. The formula shown below can be used to convert C , the temperature in degrees Celsius, to F , the temperature in degrees Fahrenheit.

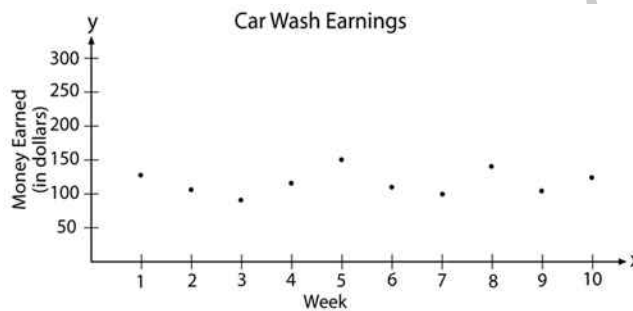
$$F = \frac{9}{5}C + 32$$

Based on this information, which of the following statements is **TRUE**?

- A 9-degree increase in C results in a 32-degree increase in F .
- A 5-degree increase in C results in a 32-degree increase in F .
- A 5-degree increase in C results in a 9-degree increase in F .
- A 9-degree increase in C results in a 5-degree increase in F .

39. The students at Albermarle High held a car wash each week for 10 weeks to earn money for the student council. The students made the scatter plot below to represent the amount of money they earned each week.

Which of the following equations **BEST** represents the line of best fit for these data?



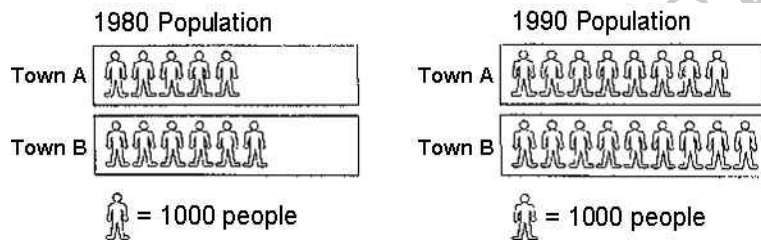
- $y = 110$
- $y = 110x$
- $y = x + 55$
- $y = -x + 55$

40. For the graph of $y = -(x - 2)^2 + 4$, the axis of symmetry is

- $x = 4$
- $y = 2$
- $x = 2$
- $x = -2$
- $y = 4$

Use the following information to answer question 41..

In 1980, the populations of Town A and Town B were 5000 and 6000 respectively. The 1990 populations of Town A and Town B were 8000 and 9000 respectively.



41. Darlene claims that from 1980 to 1990 the population of Town A had grown more.

Explain how Darlene might have justified her claim.

End of Section

42. Juan has a bag containing 3 red, 2 blue, and 5 green marbles. He removes one 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?

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

43. In the xy -plane, a line parallel to the x -axis intersects the y -axis at the point $(0, 4)$. This line also intersects a circle in two points. The circle has a radius of 5 and its centre is at the origin.

What are the coordinates of the two points of intersection?

- $(1, 2)$ and $(2, 1)$
- $(2, 1)$ and $(2, -1)$
- $(3, 4)$ and $(3, -4)$
- $(3, 4)$ and $(-3, 4)$
- $(5, 0)$ and $(-5, 0)$

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.

45. In an experiment, each of two people has six cards labelled 1 through 6. The first person chooses a card while the second person tries to choose the same card from an identical set.

What is the probability that the two people will choose the same card?

- $\frac{1}{36}$
- $\frac{2}{36}$
- $\frac{1}{6}$
- $\frac{2}{6}$

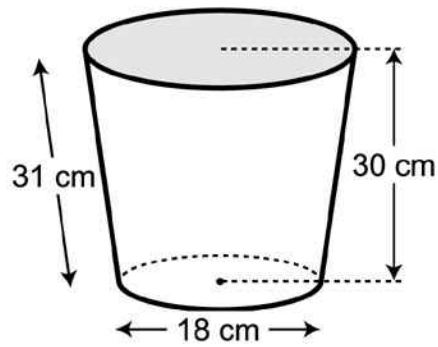
46. Brighto soap powder is packed in cube-shaped cartons. The side of each carton measures 10 cm.

The company decides to increase the length of each edge of the carton by 10 per cent. If the original volume was V what is the new volume?

- $V \times 10\%$
- $V \times 110\%$
- $V \times (110\%)^3$
- $V \times (10\%)^3$

ADMINISTER ON SCREEN ONLY

47. A bucket, in the shape of a truncated cone, has the dimensions shown. Which is the correct calculation for the diameter of the lid of the bucket?



- $2(\sqrt{31^2 - 30^2} + 9)$
- $2(\sqrt{31^2 + 30^2} + 9)$
- $2(\sqrt{31^2 - 30^2} - 9)$
- $2(\sqrt{31^2 + 30^2} - 9)$

48. Indicate whether the following numbers are **Rational** or **Irrational**.

	Rational	Irrational
$\frac{1}{7}$	<input type="radio"/>	<input type="radio"/>
$\frac{1}{\sqrt{16}}$	<input type="radio"/>	<input type="radio"/>
$\sqrt{161}$	<input type="radio"/>	<input type="radio"/>

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

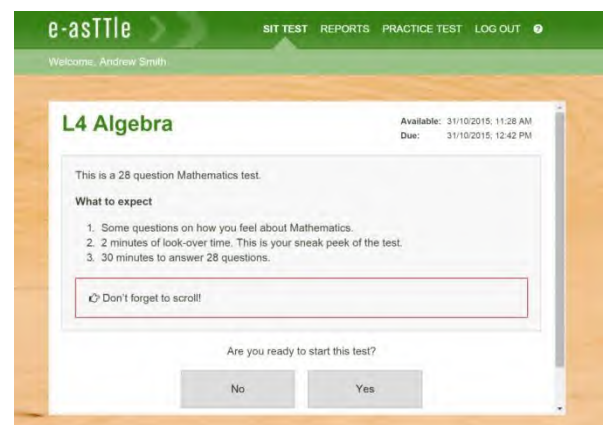
1. Check equipment

- 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.