Year 9 NUMERACY
Non-calculator

Test 1 Annotated

INSTRUCTIONS TO STUDENTS

Use a 2B pencil to show your answers.

For the multiple-choice questions, show your answer by shading the matching bubble. If you make a mistake, erase the shading and shade the correct bubble.

For the other questions, write your answer in the box provided. If you make a mistake, erase it and write the correct answer.
1. The shape below is made using 8 rectangular bricks.

Which one of the following shows the top view of the shape?

![Top view options]

2. Cards marked from 1 to 10 are shuffled and placed face down on a table. One card is selected.
What is the chance that the card selected is marked with a number less than 4?

0.1  0.3  0.4  0.7

**TRAP**
Remember that less than 4 means that 4 is not included.

**THINGS TO KNOW**
Chance = number of favourable outcomes divided by the total number of possible outcomes.

3. The thermometer shows the temperature at 9 am.

What was the temperature at 9 am?

20°C  22°C  23°C  24°C
4. 45% of the shots in a netball game missed the goals.
   18 shots missed the goals.
   How many shots at goal were there altogether?

   HINT
   Work out how many shots at goal make up 100%.

5. Shauna thought of a number.
   She added 5 then multiplied by 2.
   The answer was 24.
   What was the number Shauna thought of?

   TIP
   Remember to 'undo' operations in the reverse order.

6. The area of the shaded parallelogram is 180 cm².

   TRAP
   Think about whether you need the perpendicular height or the length of the sloping side.

   THINGS TO KNOW
   Area of a parallelogram = length multiplied by the perpendicular height.

   What is the length of the shaded parallelogram?

   cm

7. 50 - 40 × 20 + 10 could be used as a best estimate for which one of the following?

   HINT
   This is a question about rounding up and rounding down.

   o 52 - 47 × 21 + 4
   o 51 - 43 × 21 + 13
   o 47 - 47 × 26 + 15
   o 49 - 42 × 13 + 5
8 In a game, the rules are as follows:

A goal is worth 6 points.
A behind is worth 1 point.

My team scored \( g \) goals and \( b \) behinds.
Which one of the following gives the total points my team scored?

\[
\begin{align*}
g + 6b & \quad \text{☐} \\
6g + b & \quad \text{☐} \\
6(g - b) & \quad \text{☐} \\
6(g + b) & \quad \text{☐}
\end{align*}
\]

9 This solid shape is formed using cubes of side 1 cm.

The number of cubes that need to be added to make a rectangular prism containing 16 cubes is:

\[
\begin{align*}
4 & \quad \text{☐} \\
8 & \quad \text{☐} \\
12 & \quad \text{☐} \\
16 & \quad \text{☐}
\end{align*}
\]

10 Sam rolled a die 15 times and recorded the results.

The results are shown in the column chart.
What was the chance that Sam rolled a 5?

\[
\begin{align*}
\frac{1}{15} & \quad \text{☐} \\
\frac{2}{15} & \quad \text{☐} \\
\frac{1}{6} & \quad \text{☐} \\
\frac{1}{5} & \quad \text{☐}
\end{align*}
\]
11 The point marked A has the value:

\[ \sqrt{12}, \quad \frac{19}{5}, \quad 3\frac{1}{8}, \quad 3\frac{3}{4} \]

**HINT**

For \( \sqrt{12} \), is 12 nearer to 9 or 16? For the other numbers, find the decimal values.

12 The object shown is made from 9 identical cylinders. A vertical slice is made right through the object.

Which diagram below shows the shape of the cross-section made by the slice?

**TIP**

Think about what you see when you look at the front-on view of the object.

13 Which of the following expressions is equivalent to \( 3(2m - 5) \)?

\[ 2m - 15, \quad 3m - 15, \quad 6m - 15, \quad 6m - 5 \]

**HINT**

Multiply out the bracket using the distributive law.

**THINGS TO KNOW**

Distributive law: \( a(b + c) = ab + ac \)
14 Pam put all her 12 blocks into a pile as shown.
Penny grabbed some of them, leaving Pam with only $\frac{3}{4}$ of her blocks.
How many blocks did Pam have left?

TRAP
Think about whether you need to find $\frac{3}{4}$ or $\frac{1}{4}$ of the total.

15 The pie chart shows the percentages of students who generally choose one of four recreational activities.
60 students were asked to choose one of these activities.
How many students could be expected to choose football?

4 10 15 25

HINT
The number expected to choose an activity will depend on the percentage of students who generally choose that activity.

16 Three of the four expressions shown below have the same value.
Which one has a different value?

\[\sqrt[3]{27}\] \[\sqrt[5]{-4^2}\] \[2 + 1\] \[\frac{3 \times 8}{8 + 1}\]
17 Two-thirds of a group of students took part in a competition.
There were 24 in students in the group.
How many did not take part in the competition?

8  12  16  20

TRAP
First work out the fraction of students that did not take part.

18 A mouse begins at point A.
To reach a piece of cheese, it must move 5 units right and then 3 units up.
What are the coordinates of the point C where the mouse will find the cheese?
(2,0)  (0,3)  (2,1)  (5,1)

TRAP
Be careful to move across then up, rather than the other way around.

19 30 school students were asked how many books they had read during the summer holidays.
The data from the survey are shown in the bar graph below.

HINT
First find how many students read each number of books.

THINGS TO KNOW
For a set of scores: The mode is the most frequent score. The median is found by listing the scores in rank order and finding the middle score.

Which of the following is not true?
- The largest number of books read is 14.
- The mode is 4.
- The median is 7.
- The range is 14.
20 Two numbers added together equal \(-6\).
One number divided by the other number equals \(-4\).
What are the numbers?

\[ \boxed{\phantom{0}} \quad \text{and} \quad \boxed{\phantom{0}} \]

**TIP**

*Think about the sizes of the numbers if adding them results in a negative number.*

**THINGS TO KNOW**

*If dividing one number into another results in a negative number, one of the numbers must be positive and the other negative.*

21 The area of the shaded triangle is \(6\) cm\(^2\).
What is the ratio of the area of the complete figure to the area of the shaded triangle?

\[ \boxed{\phantom{0}} : \boxed{\phantom{0}} \]

**HINT**

*Think about the size of the four small triangles.*

22 What is the value of \(3h^2\) when \(h = -2\)?

\[ \boxed{\phantom{0}} \quad \boxed{\phantom{0}} \quad \boxed{\phantom{0}} \quad \boxed{\phantom{0}} \]

**TIP**

*Be careful of order of operations.*
23. \(ABCD\) is a square.
The length of \(AB\) is twice the length of \(AE\).
What fraction of the figure is shaded?

**HINT**
Fit the triangles into the square.

24. Peta is 3 places in front of Annie in a race.
Suzie is twice as many places behind Annie as Peta is places in front of Annie.
Freda is 4 places in front of Suzie.
Which of the following is true?
- \(\square\) Freda is in front of Annie.
- \(\square\) Freda is 3 places behind Annie.
- \(\square\) Freda and Annie are equal.
- \(\square\) Freda is 2 places behind Annie.

**TIP**
Use each piece of information to mark each girl’s position on the diagram.

25. Peter walked at 4 km per hour for 4 hours and then jogged for 2 hours.
He travelled a total distance of 30 km.
What was his average jogging speed?

**HINT**
First work out how far Peter walked and how far he jogged.

**THINGS TO KNOW**
\[\text{Speed} = \frac{\text{distance travelled}}{\text{time taken}}\]
26  A line is drawn through the points (2,6) and (4,4) and (0,y).

What is the value of y?

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>8</th>
<th>10</th>
<th>12</th>
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**HINT**

For a straight line, the y value changes by the same amount for each unit of change in the x value.

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27  Sam’s family used 500 L of water per day last week.

This week they used 10% less water per day.

Which calculation will give the volume of water used per day this week?

<table>
<thead>
<tr>
<th></th>
<th>500 × 1.1</th>
<th>500 × 0.9</th>
<th>500 − 10</th>
<th>500 − 0.1</th>
</tr>
</thead>
<tbody>
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</table>

**HINT**

A decrease of 10% means the new value must be 90% of the original amount.

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28  Cards marked from 1 to 10 are shuffled and placed face down on a table.

One card is selected and its number is noted.

The card is returned to the table.

A second card is selected and its number is noted.

What is the chance, expressed as a decimal, that both cards selected are marked with a number less than 4?

**TRAP**

Remember that ‘less than 4’ means that 4 is not included. Is the chance the same when the second card is selected?
29  The tangram on the left is made into the shape on the right.

Which piece is missing?

TIP  Tick off each shape as you find it.

30  The number of children at the movies was 5 more than twice the number of adults.
If there were \( c \) children at the movies, how many adults were there?

\[
\begin{align*}
2c + 5 \\
\frac{c}{2} - 5 \\
\frac{c - 5}{2} \\
2c - 5
\end{align*}
\]

HINT  Be careful of the order of operations.

31  Three of the four expressions shown below have the same value.
Which one is different?

\[
\begin{align*}
\sqrt{\frac{1}{16}} \\
\left(\frac{1}{2}\right)^2 \\
\frac{0.5}{2} \\
\frac{1}{2} + \frac{1}{2}
\end{align*}
\]