



MIGHTY MINDS
Educational Consultants

www.mightyminds.co



SAMPLE



Emeracy

Final Preparation Lesson
Yr 9

- Skills Examined
- Approaching the Test
- Practise Questions

Resource code: 27052519

NAPLAN Test Format



2015 Test timetable

Monday 11 May	Tuesday 12 May Official test date	Wednesday 13 May Official test
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1. Language conventions
Yr 9: 45 min

3. Reading tests
Yr 9: 45 min

10 minute break

4.2 Numeracy
Yr 9 (non-calc.): 40 min

Catch up tests permitted

Catch up tests permitted

Catch up tests permitted

Wednesday
20 May

Thursday
21 May

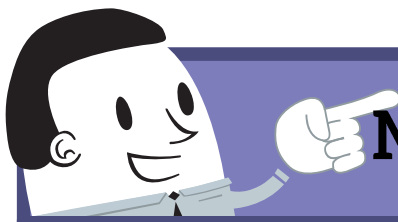
Friday
22 May

to ensure tests remain secure for schools granted approval to vary test

up tests not permitted.



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- A cartoon illustration of a person with long brown hair sleeping peacefully in a bed. They are wearing a red shirt with white polka dots and are tucked under a large purple blanket. The bed has a blue headboard and a dark purple base. The person's eyes are closed, and a small smile is on their face.



Multiple Choice Tips



1. Read the question first!



2. Underline important points and make sure you understand questions and instructions.



3. Read the possible answers.



4. Eliminate any obviously wrong answers.

For example, on the question 'What is the capital of France?', you can eliminate any answers that make no sense.



5. For literacy items, read the question carefully. If the question asks for the answer that uses language in a particular way, read the options carefully.



6. For numerical items, if you are unsure, use trial and error. If you are unsure, it means that you are not sure if the answer is correct, you can try the other options.



For example, if the question asks for the sum or pattern, you can try the other options to see if they are correct.



It is very important to do all the questions. This will make sure you do not make a mistake by missing something.



When you are doing the questions, do your thinking on the test paper.

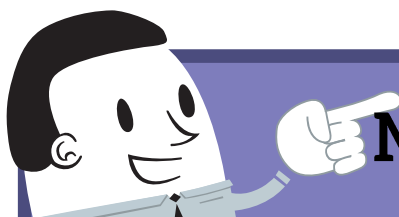


Do not write too close to where you place your answers.



Remember your working out does not have to be neat or logical to anyone but you! Your working out is not marked!





Multiple Choice Tips



9. You will often find that the last questions

in this section are more difficult than the



earlier ones. You may need to spend more time on the



10. If you can't work out the right answer,

leave a space in the answer space as you

write a wrong answer. Then plan to



return to it so if you have time at the end of the test

you can come back to it and



11. Don't spend all your time on one question. Use your

time wisely and move on to the next question if you



are unsure of the answer. If you have time left

at the end of the test, go back to the questions and go back to



one



12. You must use the space provided to record answers in

the answer space. Each item has only one



correct answer. There is no penalty for a wrong

answer. Make a guess even if you have no



idea. Remember that if you want to change your

answer, use a rubber to remove the

mark and then shade or write the

new answer in the appropriate space provided.

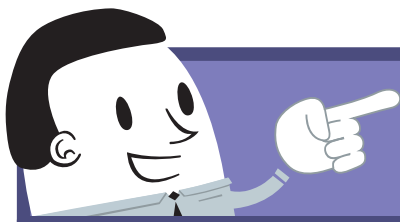
If you have time left over time, go back and double check

your answers!



SAMPLE





Numeracy Test

The Numeracy Test will quiz you on many different maths questions. *Questions will generally be multiple choice, with some short-answer questions. The test is designed to refresh your memory and check you can do everything!*



Number

- Read and understand the value of numbers from 1 - 1000
- Solve addition and subtraction problems involving numbers without a calculator, eg $4537 + 5584$
- Understand place value (thousands, hundreds, tens, ones)
- Count in 1's, 2's, 5's, 10's and 25's
- Know all of your times tables from 1×1 up to 10×10
- Be able to do multiplication and division problems with and without a calculator
- Understand, work with and be able to convert fractions, decimals and percentages, eg $\frac{1}{2} = 50\%$ and $\frac{1}{4} = 25\%$
- Count by skipping numbers with a given interval

Money

- Add and subtract coins and banknotes
- Identify money and its value, eg that seven dollars and thirty cents looks like \$7.30

Time

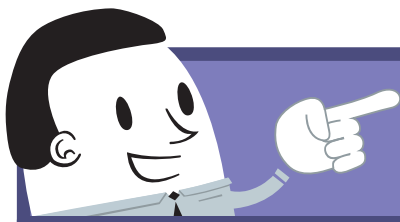
- Be able to read a clock face and tell the time
- Calculate the duration of events, eg if morning tea goes from 10.00 to 10.30, it is 30 minutes long



- Understand units of measurement and their relationships (remember: 10mm in a centimetre, 1000mm in a metre.)
- Measure length, area and volume by reading a thermometer
- Calculate the perimeter (length of the outside edge) of 2D shapes

SAMPLE

2
3
4
5
6
7
8
9
+
-
x
÷



Numeracy Test

Geometry

- Solve puzzles and patterns that use shapes instead of numbers
- Know the properties of 2D and 3D shapes, ie their names, number of faces
- Be able to visualise what a shape would look like after it has been transformed
- Determine lines of symmetry on shapes
- Describe locations on a coordinate based grid square
- Compare different sizes of angles and know what they are called

Algebra/Patterning

- Estimate, measure and compare different quantities
- Work out the rule a number pattern is following

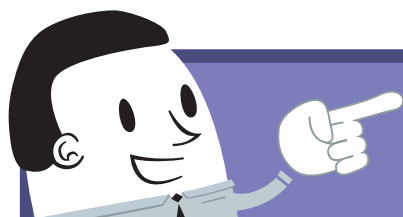
Probability

- Identify the chance of something happening, eg a bag filled with 10 blue marbles and 20 red marbles
- Read and use graphs, Venn diagrams, bar charts, line graphs or data
- Conduct a variety of probability experiments, record results and make predictions using diagrams

Test Tips

- Have I read the question carefully?
- Have I written down what I am asked to do any calculations?
- Would it be easier to work with a smaller number?
- Have I checked my answer?
- Did I check my rough estimate?
- Have I checked or reattempted the questions I was unsure of?
- Have I used a technique like 'flow chart', 'table' or 'work backwards'?





Calculator Tips

Your calculator is an invaluable resource, as it can work out sums and operations in a fraction of the time it would take you to do it manually. *Most errors that occur when using a calculator are due to typing the values or symbols in incorrectly, so make sure you are extra careful. The following is a list of hints and tips to help you get the most out of your calculator to its full potential. You may also need to refer to the manual to learn how to use your calculator effectively. Some calculator brands have theirs online.*



Multiplication, division, addition, subtraction: $\times / + -$ Y

Order of Operations: The order of operations is built into your calculator. To make sure you perform each step of every equation in the correct order, make sure you follow the order of operations. Remember - BODMAS or BOMDAS. *Brackets, Orders, Division and Multiplication, Addition and Subtraction.* It does not matter what order you do addition/subtraction in: do them in the order they are in the equation.

Brackets: Whatever is placed in brackets will be calculated first. For example, if you are asked to find the sum of 3 and 4 and then multiply it by 2, you would enter $(3 + 4) \times 2 = 14$. If you didn't use brackets, following the order of operations, you would get an answer of 11.

Square root: The symbol $\sqrt{}$ on your calculator will find the square root of a number. Make sure you enter the number after you have pressed the square root button.

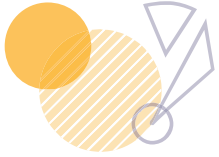
Powers: Calculators usually have buttons for squaring and cubing numbers, and they will look like x^2 and x^3 respectively. Type the number you want to raise before you hit the x^2 or x^3 button. For raising numbers to powers other than 2 or 3, use the x^y button. To do so, place the number you wish to raise first, followed by the x^y button, then the power you wish to raise it to. Eg $6^4 = 6^4 = 1296$

Percentages: Most calculators have a percentage button. You can use, but if not, percentages are calculated by dividing the number by 100. For example, if I got 22 out of 25 on my spelling test, my percentage would be $\frac{22}{25} \times 100 = 88\%$

Fractions: Most calculators have a fraction button. You can use this to enter a fraction (top number) over a denominator (bottom number). Some calculators have a button that looks like this: $\frac{\square}{\square}$ or a^b/c . If not, the division or $/$ symbol will work. To enter a fraction using these buttons, type the numerator, click the $\frac{\square}{\square}$ or $/$ or division button, then type the denominator. To make a mixed number on your calculator (a fraction such as $2\frac{1}{2}$), use the $\frac{\square}{\square}$ button, click it first, then blanks will appear for you to scroll through the numbers. If your calculator does not have this button, type the whole number, then click the $\frac{\square}{\square}$ or division button, then type the numerator, click the $\frac{\square}{\square}$ or $/$ or division button, then type the denominator. Most calculators can also convert between fractions and decimals. If your calculator has a button that looks like $F \leftrightarrow D$, click it. If not, to change a fraction to a decimal simply divide the numerator by the denominator on your calculator.

Negative numbers: If your calculator doesn't have a special negative button that looks like $(-)$, the $-$ button will work. If you are raising a negative number to a power, you need to put the number and the power outside them eg $(-2)^3 = -8$.





Item Description

Please note: any activity that is not completed during class time will be undertaken at a later date.



Numeracy Learning

Activity Description:

- This worksheet contains 13 numeracy activities that will utilise a broad range of mathematical techniques. The activities involve measurement, time, graph/grid/map reading and problem solving, shape and chance.

Purpose of Activity:

- This activity is designed to develop mathematical skills (such as those listed in the Learning Objectives). They will also learn interesting facts about the world and some geographical information.

KLAs:

CCs:

for diagrams or maps or graphs (α6)
two dimensions (α51)

calculators (Φ16)
(9)

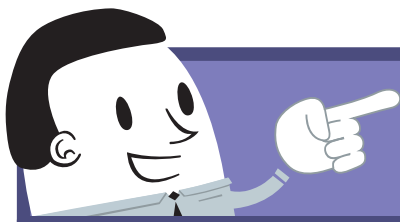
Suggested

approximately one hour to complete.

Teacher

After each question, go through the answers as a class. Discuss the answers and discuss the model responses and how to reach each answer. If students are having difficulty with shape and measurement, encourage them to look for shapes in their day-to-day lives. They can measure the perimeters, areas, and surface areas. Sometimes it is easier for students to understand concepts when they can see how the concept is put into practice.





Skills Examined

There are two NAPLAN Numeracy tests: one where you can use your calculator and one where you cannot. Both are very similar, with the only real difference being that some of the calculator test are too complex to be worked out manually or in your head. The tests cover maths questions on many different topics, including algebra, number, geometry and measurement. These topics are further divided up into subtopics. Provided with the topics outlined below, you should have no trouble tackling every question.



Algebra & Function

Algebra is the branch of maths concerned with working out the value of a variable in an equation where a particular value is symbolised with a letter. You will then need to figure out the value of x by performing operations. You will also need to transform a word problem into an equation. Functions are also useful for describing relationships between things. They can be used to work out future values. For instance, if you knew the first number in a sequence, you should work out the 200th number just by doing one sum.

Angles

Angles are the shapes formed by two lines meeting at a point. Practically every linear shape except a circle. You may be asked to find the size of an angle or work out its actual size.

Coordinates & Map Skills

Coordinates are the location of a point on a map. Map skills include being able to read a scale, follow compass points, and find a location on a map.

Data

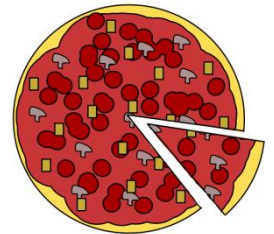
Data is statistical information. It is usually compiled in tables and graphs. You will be familiar with how to read different types of graphs.

Dimension

Dimension refers to the measurement of an object. It can be 2D and 3D. In the tests, you may be asked to calculate area and volume. You will need to know the formulas for these calculations.

Fractions

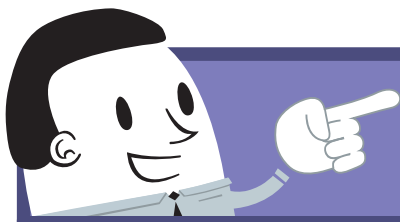
Fractions are used for representing parts of a whole. You will need to know how to add, subtract, multiply and divide fractions, and convert between the two.



The test will basically be sums containing addition (+), subtraction (-), multiplication (\times) and division (\div). Some will require a calculator to be solved, others will not.

There will be one or two featuring either a number pattern or a picture pattern. You might be asked to find a missing number or work out a later value.





Skills Examined

Rates

Rates are ratios that relate two different measurements to each other. This is done by using the word 'per' or the forward slash symbol (/). An example of this is the cost of petrol, which is expressed in cents per litre or c/L. You may be asked to calculate a rate or some other measurement based on a given rate.

Ratio & Proportion

Ratios and proportions are different ways of comparing one thing to another. A ratio shows just one part of the whole, kind of like a fraction. A proportion shows two ratios that are equal, using the forward slash (/) or the words 'out of'. You may be asked to write a ratio or proportion, or calculate a value based on a given ratio or proportion.

Shape

There are many types of questions that you may be asked to visualise what a shape made of one's blocks would look like. You may be asked to draw lines of symmetry and identify different shapes. You may be asked to draw a net for a prism, draw lines of symmetry, or calculate the number of edges.

Time

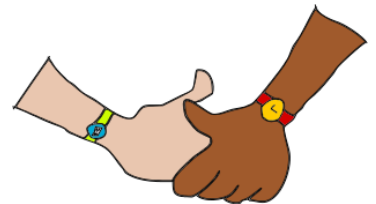
Time questions will either ask you to calculate a starting or ending time, or to calculate the difference between two times. You may be asked to convert time from one unit to another, such as seconds, minutes, or hours.

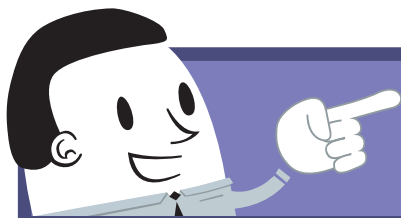
Chance

Chance is the probability of something happening. It is expressed as a fraction, a percentage or in words such as 'one in ten'.

Calculator

To avoid getting stuck on your calculator, go in to the test with confidence.





Approaching the Test

Each numeracy test will take 40 minutes, and will comprise roughly 32 questions, which is more than a minute for each question, which is ample time to complete. Questions are multiple choice, with only one or two being short response. If you get an incorrect answer, so even if you cannot find a solution to a question, making sure this guess is educated is to look at the question and eliminate the wrong options. Any options that looks ridiculous or is not within this range would be. For instance, if a question is about how many litres of milk a baby drinks a day, an option like 1000 would just be impossible, so if that was an option, you can eliminate it. To prevent the chance of you having to make wild guesses, revise the topics and practice your calculator skills.



Algebra & Function

- **Evaluation** questions will simply ask you to solve a linear equation with one or two unknowns on either side of the equals sign. To solve a linear equation, you need to move the equation around, isolating the unknown. To do this, you need to move all of the known values on the other side. To get a value for the unknown, you need to perform the opposite operation to both sides of the equation. For example, if you have $3a + 2 = 23$, you need to subtract 2 from both sides. If you want to get rid of a $3x$, you need to divide both sides by 3. Here is a step by step example.

○ eg $3a + 2 = 23$

We want to get the 2 and the 3 on the left side of the equals sign. The opposite of adding 2 is subtracting 2. The opposite of multiplying by 3 is dividing by 3. We can work out the answer.

$$\rightarrow 3a + 2 - 2 = 23 - 2$$

$$\rightarrow 3a = 21$$

We have now removed the 2 from the left side of the equation. We are now one step closer to getting the 3a by itself. We need to get rid of the 3. 3a is the same as $3 \times a$, therefore, we need to divide both sides by 3.

$$\rightarrow 3a \div 3 = 21 \div 3$$

$$\rightarrow a = 7$$

To check if the answer is correct, substitute it ($a = 7$) back into the original equation. It works.

$$\rightarrow 3 \times 7 + 2 = 23$$

$$\rightarrow 21 + 2 = 23$$

The equation has been solved, and the value of a successfully

- **Form** questions will ask you to solve a problem with an unknown in it, and you will need to write an equation to solve it. It sounds like: just call the unknown value x or something. For example, Fanny is 46 years old. She is four years older than three times Erica's age. How old is Erica?

Let's write everything in the equation in terms of f and e .

Fanny is four years older than three times Erica's age: $46 = 3e + 4$

To solve for e , we need to get e by itself. We can do this by putting all the numbers on the opposite side of the equals sign, so we have $3e = 46 - 4$.

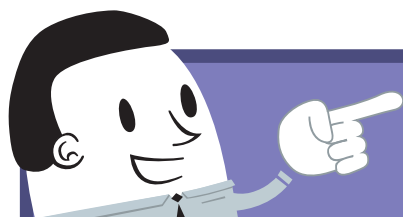
First get rid of the $+4$ by taking 4 from both sides

Next, divide both sides by 3 to get e by itself.

Erica is 14. Now check by substituting $e = 14$ into the original sum.

$$3(14) + 4 = 46 \checkmark$$





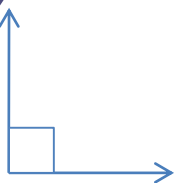
Approaching the Test



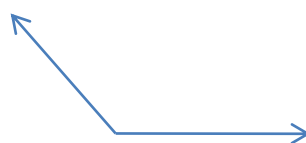
- One way of thinking about **like terms** is imagining them as being the same expressions. An algebraic expression can contain numbers, pronumerals (unknown values) and indices (powers like 2 and 3). Like terms have the same pronumerals and powers, but can have different numbers in front of them. $4de$ and $58de$ are like terms (they are both in the xy^3 species), but $9x^2z$ and $2xy^3z$ are not. Like terms can be added and subtracted from each other, but unlike terms cannot. However, unlike terms can be multiplied and divided. In the test, you might be asked which of two expressions are like terms, or you may look wildly different at first, but once you collect the like terms, you will find they are the same.
 - e.g. $4de + 4d^2 + 54de - d^2 + 3d$ is the same as $58de + 3d^2 + 3d$
 - Like terms are underlined and circled: $4de + 4d^2 + 54de - d^2 + 3d$
 - Like terms should then be added and subtracted: $58de + 3d^2 + 3d$
 - The equation can now be written as $58de + 3d^2 + 3d$
- **Indices**
 - You need to be familiar with the rules of indices that happen when numbers or algebraic expressions are added, subtracted, multiplied or divided by each other. This is a common question pops up in the test that requires you to solve for a variable.
 - Multiplication: when multiplying, add the indices.
 - Rule: $a^m \times a^n = a^{m+n}$
 - eg $2^3 \times 2^4 = 2^{3+4} = 2^7$
 - Division: when dividing, subtract the indices.
 - Rule: $a^m \div a^n = a^{m-n}$
 - eg $2^7 \div 2^4 = 2^{7-4} = 2^3$
 - **Remember:** $a^0 = 1$ for any non-zero a . Thus, t^{17} is the same as $t^{17} \div t^4$.
 - Power of 0: any number to the power of 0 is equal to 1.
 - Indices: when a power is raised to another power, multiply the indices.
 - Rule: $(a^m)^n = a^{m \times n}$
 - eg $(2^3)^4 = 2^{3 \times 4} = 2^{12}$
 - Indices: when a product is raised to a power, every factor of the product is raised to that power.
 - Rule: $(a^m b^n)^p = a^{mp} b^{np}$
 - eg $(2^3 3^4)^2 = 2^{3 \times 2} 3^{4 \times 2} = 2^6 3^8$



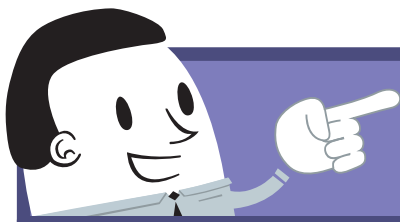
Angles are measured in degrees from 0° - 360° and the name of an angle depends on its size.



Right (exactly 90°)



Obtuse (greater than 90° but less than 180°)



Approaching the Test

Coordinates & Map Skills

• Grid References/Coordinates

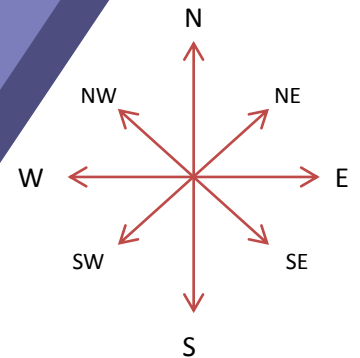
- Many maps have areas and grid reference to help you locate points on them. Usually, these grids will have a horizontal axis marked with letters and a vertical axis marked with numbers. Coordinates like these are read horizontally first, then vertically. Remember this with the saying "You crawl before you walk".
 - eg The dog's kennel on this grid is located at E5

• Scales

- Real-life distances obviously don't fit on maps. A scale, which is condensed is used to indicate the relationship between the distance on the paper. Map scale is usually written as:
 - eg 1:100 000

• Cardinal Points

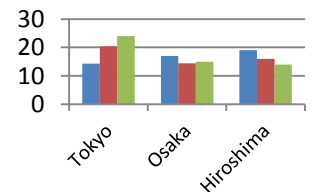
- The four cardinal or compass points are North (up), East (right) and West (left). If you start at north and go clockwise, you get the "Weetbix": (North, East, West, South). These points are intercardinal points, which are between the cardinal points.



Data

• Tables and Graphs

- Data is information collected from people or events) by conducting surveys, experiments, etc. It can be displayed in tables so that it's easy to compare and contrast. A graph is a visual representation of data and are not useful to display others. For example, bar graphs are useful for comparing parts of data, while line graphs are useful for showing changes over time. There are many different types of graphs, but the most common ones are bar graphs, line graphs, and pie charts.

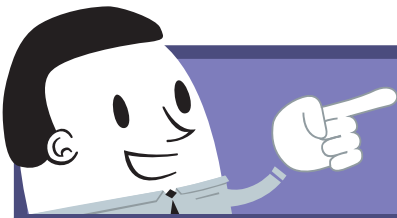


Measures of central tendency, which include the mean, median, mode, and range. The mean is the average score, the median is the middle score, the mode is the most frequently occurring score, and the range is the difference between the highest and lowest score.

The mean is the average score in a set of data. To work it out, divide the sum of scores by the number of scores.

Example: Data set: Runs made in 7 games of cricket = 4,4,7,5,6,7,11

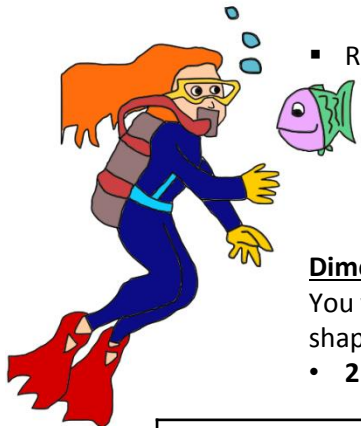
$$\begin{aligned}\text{Mean} &= \frac{\text{sum of scores}}{\text{number of scores}} \\ &= \frac{(4+4+7+5+6+7+11)}{7} \\ &= 6\end{aligned}$$



Approaching the Test








- Median: The median is the middle number in a set of scores when arranged in ascending or descending order. To work out which score is the median, use the formula $(n+1)/2$, where n = number of scores. If there is an even number of scores, the median is the average of the two middle scores.
 - Eg If a class of 27 recorded their heights, the median height would be $(27+1)/2 = 28/2 = 14$. Therefore, once they had been ordered from shortest to tallest, the 14th score would be the median.
- Mode: Score that occurs most frequently.
 - Eg Kaia is a scuba diving instructor and recorded the number of fish she saw for a week: 7, 6, 7, 3, 9, 4. Mode = 7
- Range: The difference between the highest and lowest scores. To calculate the range, subtract the lowest score from the highest score.
 - Eg Kaia recorded the number of fish she saw each day on the following table:
Range = 9 - 3 = 6



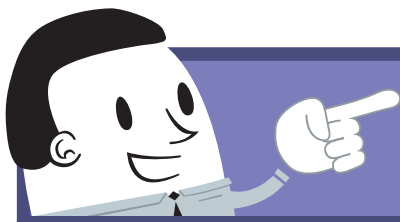
Dimension

You will need to know the formulas for the calculations of all 2D and 3D shapes. Remember to use the correct units.

- 2D Shapes


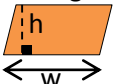
Shape	Perimeter
Square 	Perimeter = 4 x side = 4s
Rectangle 	$P = 2 \times \text{length} + 2 \times \text{width}$ = $2l + 2w$
Parallelogram 	Perimeter = s + s + s + s (the sum of all sides)
Circle 	Circumference = $\pi \times \text{diameter}$ = πd Note: a circle's perimeter is called its circumference
Trapezium 	Area = $\frac{1}{2} \times (\text{top} + \text{bottom}) \times \text{height}$ = $\frac{1}{2} (a+b) \times h$ Where a = top length b = bottom length



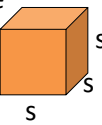
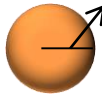
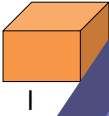






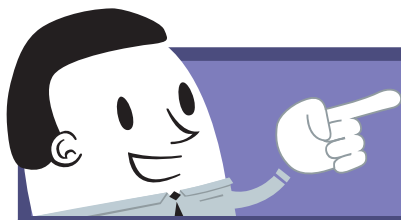
Approaching the Test

• 2D Shapes cont.

Shape	Area	Perimeter
Rhombus 	Area = $\frac{1}{2} \times \text{diagonal}_1 \times \text{diagonal}_2$	Perimeter = $4 \times \text{side}$
Parallelogram 	Area = width x perpendicular height $= w \times h$	Perimeter = $2 \times (\text{side}_1 + \text{side}_2)$

• 3D Shapes

Shape	Volume	Surface Area
Cube 	Volume = side x side x side $= s^3$	Surface Area = $6 \times \text{side}^2$
Sphere 	Volume = $\frac{4}{3} \times \pi \times \text{radius}^3$ $= \frac{4}{3} \pi r^3$	Surface Area = $4 \times \pi \times \text{radius}^2$ $= 4\pi r^2$
Rectangular Prism 	Volume = length x width x height $= l \times w \times h$	Surface Area = $2lw + 2wh + 2lh$
Triangular Prism 	Volume = $\frac{1}{2} \times \text{base} \times \text{height} \times \text{length}$ $= \frac{1}{2} b \times h \times l$	Surface Area = (base x perpendicular height) + (length _{side1} x width _{side1}) + (length _{side2} x width _{side2}) + (length _{side3} x width _{side3})
Pyramid 	Volume = $\frac{1}{3} \times \text{base} \times \text{height}$ $= \frac{1}{3} b^2 h$	Surface area = (base x base) + (4 x base x side)
Cone 	Volume = $\frac{1}{3} \times \pi \times \text{radius}^2 \times \text{height}$ $= \frac{1}{3} \pi r^2 h$	Surface area = $\pi \times \text{radius}^2 + \pi \times \text{radius} \times \sqrt{\text{radius}^2 + \text{height}^2}$ $= \pi r^2 + \pi r \times \sqrt{r^2 + h^2}$
Cylinder 	Volume = $\pi \times \text{radius}^2 \times \text{height}$ $= \pi r^2 h$	Surface area = $(2 \times \pi \times \text{radius}^2) + (2 \times \text{height} \times \pi \times \text{radius})$ $= 2\pi r^2 + 2h\pi r$

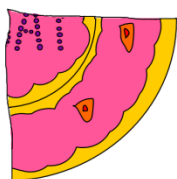


Approaching the Test

Fractions and Percentages

Fractions

- A fraction represents part of a whole. They are expressed as a numerator (top number) over a denominator (bottom number). The easiest way to imagine a fraction is something like a birthday cake. If a cake was cut into four equal pieces and you ate one, you have eaten $\frac{1}{4}$ of the cake. This means that there will be $\frac{3}{4}$ of the cake left. If you had eaten $\frac{4}{4}$ of the cake, i.e. a whole cake, or 1.



$$= \frac{1}{4}$$



$$= \frac{4}{4} = 1$$

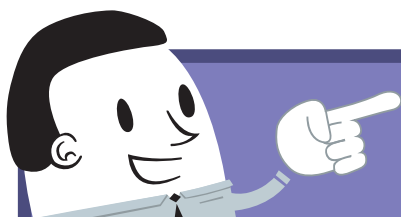
- You need to reduce fractions to their simplest form. To do so, you need to find the highest number that both the numerator and denominator can be divided by. For example, if you have $\frac{20}{100}$, you can divide both by 20, which goes into them 2 and 5 times respectively, giving you $\frac{1}{5}$.
- An improper fraction is a fraction where the numerator is bigger than the denominator, which means the value is greater than 1. For example, $\frac{11}{3}$. A mixed number is a different way of representing an improper fraction, where it is represented with a whole number and a proper fraction. For example, $3\frac{2}{3}$. To convert an improper fraction to a mixed number, you just divide the numerator by the denominator. The whole number part is the quotient, and the remainder is the numerator of the fraction part.
- To convert a mixed number to an improper fraction, multiply the whole number by the denominator, then add the numerator. For example, $3\frac{2}{3}$ becomes $\frac{(3 \times 3) + 2}{3} = \frac{11}{3}$.



SAMPLE

- To add or subtract fractions, they need to have the same denominator. To do so, find the lowest common multiple (LCM) of both denominators. This means the lowest possible number that both denominators can be divided by. For example, the LCM of 3 and 4 is 12. This will be the new denominator. Multiply each fraction's numerator and denominator by whatever value gets the denominator to the lowest common multiple.

- To add or subtract mixed numbers, first convert them to improper fractions. For example, $3\frac{2}{3} + 2\frac{1}{4}$ becomes $\frac{11}{3} + \frac{9}{4}$. The smallest possible multiple that both 3 and 4 go into is 12, which means the LCM is 12. Multiply each fraction by their lowest common multiple. The sum then becomes: $\frac{(1 \times 4)}{(3 \times 4)} + \frac{(2 \times 3)}{(4 \times 3)} = \frac{4}{12} + \frac{6}{12}$



Approaching the Test



- Multiplying fractions is a lot easier: simply multiply both numerators together. Then simply place the new numerator over the product of both denominators together.

- eg $\frac{1}{3} \times \frac{2}{4} = \frac{(1 \times 2)}{(3 \times 4)} = \frac{2}{12} \rightarrow \frac{1}{6}$

- Multiplying fractions is a lot easier: simply multiply both numerators together. Then simply place the new numerator over the product of both denominators together.

- Dividing fractions is similarly easy. Flip the second fraction and then treat it as a multiplication sum, i.e. multiply the first fraction by the flipped second fraction over the product of both denominators.

- eg $3/7 \div 5/8 = 3/7 \times 8/5 = ((3 \times 8))/((7 \times 5)) = 24/35$

Percentages

- Percentages are basically just a fraction. They are used by shops to show discounts; by gyms to tell clients how many calories they burn; by banks to show interest rates; and by teachers to show how well students performed in tests; as well as the likelihood of snow or rain.

- eg 16% represents the fraction $16/100$, which equals 0.16 as a decimal.

Converting between fractions and percentages

- To change a fraction into a percentage, first convert it into a decimal by dividing the numerator by the denominator, then multiply the answer by 100.

- eg A score of 19 out of 20 is a percentage of $(19 \div 20) \times 100 = 95\%$. This is also true for common fractions: $1/10 = 10\%$, $1/5 = 20\%$, $1/4 = 25\%$, $1/2 = 50\%$.

- To change a percentage into a fraction, first divide the percentage over 100 and reduce it to its lowest common factor. For example, 20% is $20/100$, which simplifies to $1/5$.

Factor = 20. $80 \div 20 / 100 \div 20 = 4/5$

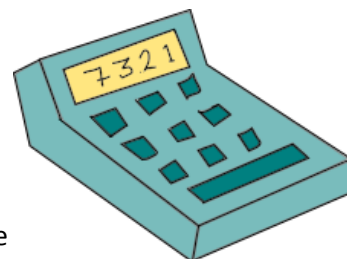
Operations

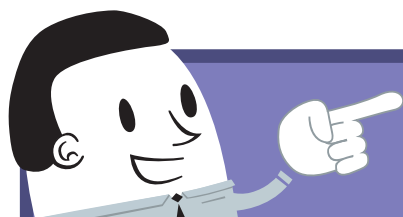
Many questions will require you to solve sums and mathematical equations using all of your operations: +, -, ÷, x; as well as indices.

- Addition: To add numbers together and find their sum. This operation is symbolised with a plus sign (+). It doesn't matter which way around an addition sum is written, you will get the same answer as $8 + 5$, which is 13.



Subtraction is the opposite of addition. It involves subtracting one number from another to work out the remainder or difference. Subtraction is symbolised with a minus sign (-), and like addition can only be written one way – it cannot just be





Approaching the Test

switched around, ie $10 - 4 = 6$, whereas $4 - 10$ would give -6 .

- Eg $101 - 13 = 88$

• Multiplication

- Multiplication or times is a type of repeated addition. It is sometimes on computers, an asterisk is used instead ($*$) instead of the letter x. You might remember learning multiplication as three bunches of three carrots is 3×3 , which is the same as $3 + 3 + 3$. Another way of writing a multiplication is using the word product, e.g. the product of 7 and 6 is the same as 7×6 . You should be familiar with your times tables up to at least 12×12 .
 - eg $6 \times 11 = 66$

• Division

- Division is just the opposite of multiplication. It is written using a division sign (\div) or a forward slash ($/$). Questions will often ask you to divide one number into another. A fraction is also a type of division, but it is often written as a fraction, which is just less messy, or sometimes more apt, to write a decimal, which is often written in decimal form, 0.75.
 - eg $80 \div 10 = 8$

• Indices and Powers

- When a multiplication or division involves a large number, it can be simplified into index form. To do so, you write the number as a power of a base, where the power or index indicates how many times the base is multiplied or divided by itself. For instance, $4 \times 4 \times 4$ can instead be written as 4^3 . Similarly, 100×100 is written as 100^2 , it is described as being squared, whereas when the base is a variable, the terminology to use is cubed. Remember that anything to the power of 2 is squared, and anything to the power of 3 is cubed. If you have a power of $\frac{1}{2}$ results in having to find the square root and a power of $\frac{1}{3}$ results in having to find the cube root.
 - eg $2^3 = 8$

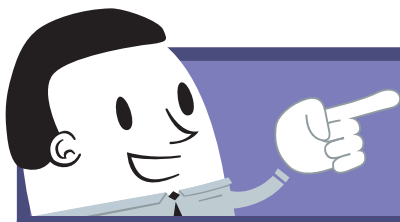
• Roots

- The root of a number is finding its root. A square root would mean finding a number that, when multiplied by itself, gives the original number. If just twice to give your end result. A cube root would mean finding a number that is multiplied by itself three times to give the end result. To write the number of the root to the left of the symbol. For example, the square root of 25 would be written as $\sqrt{25}$. Most of the time, you will need to use a calculator to find the root.



When solving equations, it is important to follow the order of operations, which is just by reading them from left to right. Because not all equations are simple, there is a set of rules students must learn to make sure they solve them in the correct order. Scientific calculators have a memory function, but many more basic calculators do not. The order is:

1. Brackets ($()$) – if any parts of the equation are in brackets, solve them first. If there are brackets within brackets, solve them from inside out.
2. Powers – work out the answer of any numbers raised to powers next.
3. Division/Multiplication – Do these sums third as they appear from left to right.
4. Addition/Subtraction – Finally, perform the addition and subtraction within the equations within.



Approaching the Test

the sum from left to right. There are many different acronyms remembered by, for example BIDMAS.

- eg $3 + 4 \times 2 + (7 \times 8)$ Solving this sum from left to right gives $7 \times 8 = 23 \times 8 = 168$. This is not the answer. Applying BIDMAS would be solved first, followed by the multiplication and then the addition last. $= 3 + 4 \times 2 + 56 = 3 + 8 + 56 = 67$. This is the correct answer.



Pattern

Number Patterns

- Number patterns follow a rule, and feature a sequence of numbers in descending order. You may be asked to work out a number quite far down the track. To do so, you need to find the rule between each value in the sequence and then determine the next value.
- To work out the rule, look at whether the numbers are increasing or decreasing and look at whether consecutive values change by a fixed amount, such as addition, subtraction, division, squaring, cubing or even more complex rules.

- eg **3, 5, 9, 17, 33...**

Ask yourself: how can I get from one number to the next?

$$\rightarrow 3 + 2 = 5$$

$$\rightarrow 3 + 3 - 1 = 5$$

$$\rightarrow 3 / 3 + 5 = 5$$

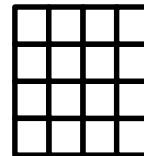
$$\rightarrow 3^2 - 4 = 5$$

$$\rightarrow 3 \times 2 = 6$$

When applying the rule to find the next number in the sequence, only the last rule produced the next number in the sequence.

Diagram Patterns

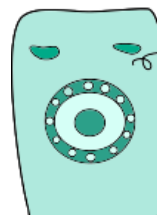
- Not all patterns are numerical. Some are diagrams that will change according to a certain rule. You may be asked to work out what the next picture in the sequence is.
- eg A sequence of squares, each increasing its size by increasing the length of each side by 1 unit.

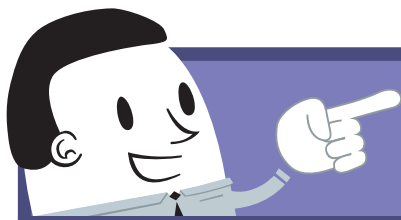


Rate

Usually measured relative to one unit of the second quantity, e.g. $\text{£}1.70/\text{kg}$. Because a rate is like a ratio, when solving rates you often need to simplify ratios. This can involve converting between various units, multiplication and division.

One card where I can ring Pakistan from
If I spoke to my auntie for
es, I will have used





Approaching the Test

Conversions

- **Mass:**
 - 1000 milligrams (mg) = 1 gram (g)
 - 1000 grams (g) = 1 kilogram (kg)
 - 1000 kilograms (kg) = 1 tonne (t)
- **Volume:**
 - 1000 millilitres (mL) = 1 litre (L)
 - 1000 litres = 1 kilolitre (kL)
- **Distance:**
 - 10 millimetres (mm) = 1 centimetre (cm)
 - 100 centimetres (cm) = 1 metre (m)
 - 1000 metres (m) = 1 kilometre (km)
- **Time:**
 - 60 seconds (s) = 1 minute (min)
 - 60 minutes (min) = 1 hour (h)
 - 24 hours (h) = 1 day
 - 365 days = 1 year
- **Currency:**
 - 100 cents (c) = 1 dollar (\$)



Ratio & Proportion

Like fractions and percentages, ratios are a way of comparing numbers. In presenting your final answer, ratios are usually in a common form, which is down by dividing both sides of the ratio by the common factor or number that goes into both of them.

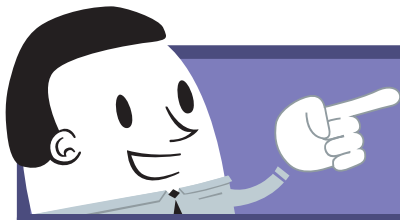
Ratio

- **Ratios** compare two or more quantities. They are separated by a colon (:) or the word 'to'.
 - For example, if you have 10 sneakers, 2 pairs of sandals and 5 pairs of high heels, the ratio of sneakers to sandals to high heels is 10:2:5.

Proportion

- **Proportions** are similar to ratios, but instead of comparing two values to each other, they compare a part to the whole using a forward slash (/) or the words 'out of'.
 - For example, if you have 10 sneakers, 2 pairs of sandals and 5 pairs of high heels, the proportion of sneakers to the total number of shoes is 10/17.





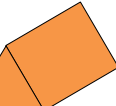


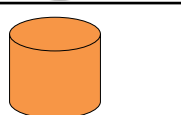
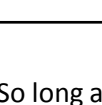


Approaching the Test

Shape:

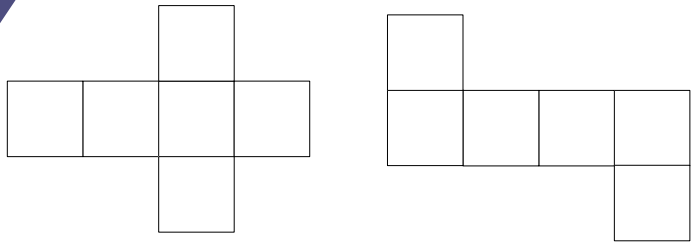
Provided you have a sound knowledge of the properties of all 2D and 3D shapes, you should not have any trouble with the shape questions on the numeracy tests, including those that have been rotated or transformed.

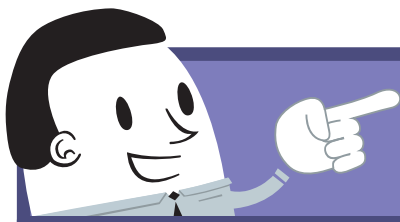
• **Properties of 3D Shapes**

Name of Shape	No. Of Faces	No. Of Edges	No. Of Vertices	Diagram
Sphere	1	0	0	
Cube	6	12	8	
Rectangular Prism	6	12	8	
Triangular Prism	5	9	6	
Square Based Pyramid	5	8	5	
Cone	2	1	1	
Cylinder	3	2	0	

• **Nets**

A net is a 2D shape that can be folded to form a 3D shape. So long as you know in advance what a net looks like, you shouldn't have any trouble identifying their nets. There are several different variations to a particular shape's net, and as long as it can form the desired shape, it is valid.





Approaching the Test

• Base Ten Blocks

- You probably learned to count with these when you were little. In the NAPLAN test, you may occasionally be asked to identify compound shapes made of these blocks from different angles. Remember that the blocks come in ones, rows of 10 and blocks of 100.



• Lines of Symmetry

- You may be quizzed on your knowledge of symmetry. Remember the lines of symmetry a particular shape has. Remember to draw the line through a shape, dividing it in half so that the two pieces are identical.

Time

• Analogue Time

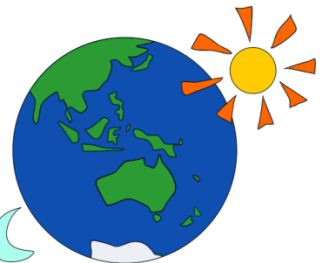
- Analogue clocks indicate time with two hands: an hour hand and a second hand. You need to remember that the hour hand moves slowly with each minute: the hour hand does too, but only a little. For example, if the minute hand would be on the 6 to show that 30 minutes past the hour, the hour hand would be halfway between the 10 and the 11.

• Digital or 24-hour time

- Although analogue clocks are used in many places, often digital clocks make use of the 24 hours in a day. Make sure you know how to read digital time and 24-hour time.
 - eg 15:00

• Time Zones

- Because of the size of the world, some parts of the world are so far apart that everyone does not run on the same time. It is important to understand time zones. GMT or Greenwich Mean Time is the standard time zone. Greenwich is a place in London. To the east, hours are added to GMT. To the west, hours are subtracted from GMT. So when it's 1pm in Greenwich, it's 11pm in Brisbane.



Chance

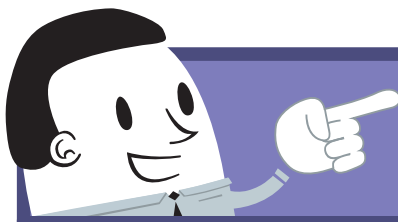
The chance of something happening can be expressed as a fraction, a percentage, a proportion or in words, such as 'one out of ten'.



For example:

There are 9 kittens. Two were spotty, three were brown, three were white and one was black. If I selected a kitten at random, there would be a:
2/9 chance it would be spotty
3/9 (1/3) chance it would be brown.
3/9 (1/3) chance it would be white
1/9 chance it would be black





Practise Questions

Leon is planning a holiday to Peru. *When trying to budget for his itinerary, he has become stuck on a collection of maths problems.*



Q1

Peru's currency is called nuevo sol. There are 100 centimos in a nuevo sol. Centimos come in 5, 10, 20 and 50 centimo pieces. Leon has some centimo pieces. Their total value is 1 nuevo sol and 50 centimos. How many centimo pieces does he have?

Q2

Leon wants to hike to the site located in Cusco that is raised 2430m above sea level. The diagrams below, calculate their values. Is the angle acute, right or obtuse.



$\theta =$

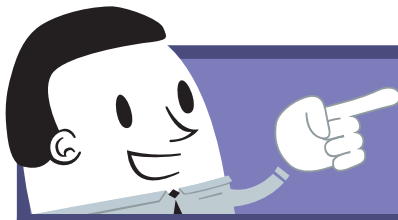


Leon will spend 30 days in the country for a total of 30 days. He will spend 5 days in Lima, 10 days in Aguas Calientes, 3 days in Iquitos, 7 days in the Amazon, and 5 days in Asia. Express the time he will spend in each area as a fraction of the total time.



Tip

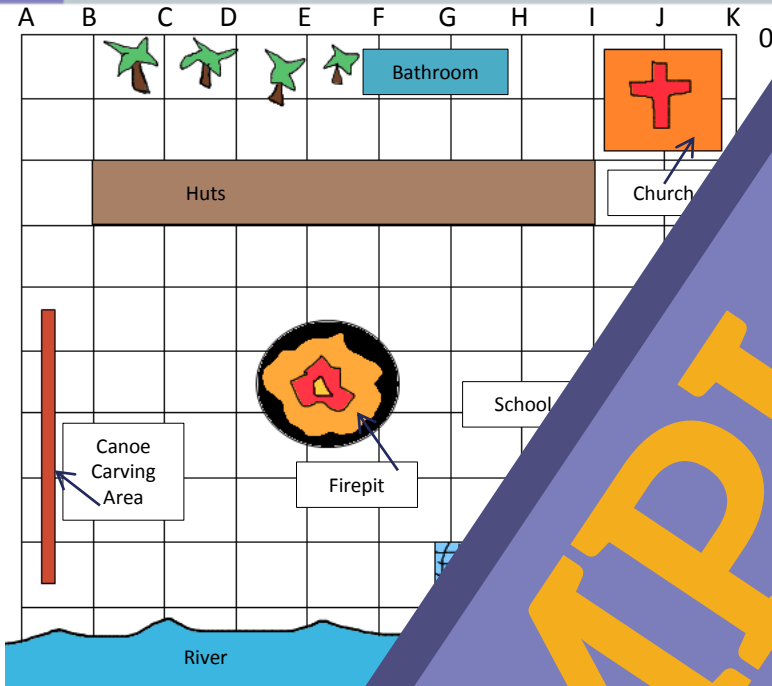
If necessary, round your answers to two decimal places.



Practise Questions

Q4

Below is a map of the Amazon Village Nuevo Loreto . Exam questions on the lines underneath.



Q5

Leon is tossing up whether to travel independently or as part of a tour. He wants to stay in the village for 3 nights, meaning he would need breakfast, lunch and dinner for every feature offered by Adventure Tours. He can either book everything himself less expensively or join a tour. The costs are listed below. Which would work out to be cheaper?

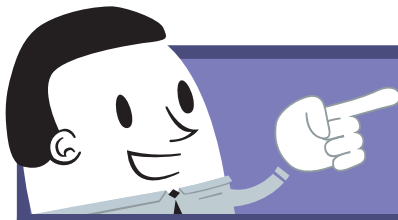
Includes:

- 3 nights
- Canoe
- ...
- ...

Independent Travel

- Rupa Wasi Eco Lodge = \$41 per night.
- One way bus ticket = \$4.50
- Entry to Machu Picchu = \$40
- Guided tour of Machu Picchu = \$20
- Each meal = roughly \$15
- Entry to the Hot Springs = \$10





Practise Questions

Q6

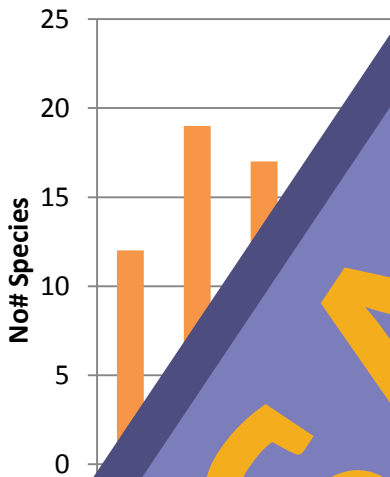
The most visited destination in Peru is the Temple of the Sun where people celebrate and worship Inti, an important Incan god. While Leon notices a pattern on the brick that has worn away at different places.



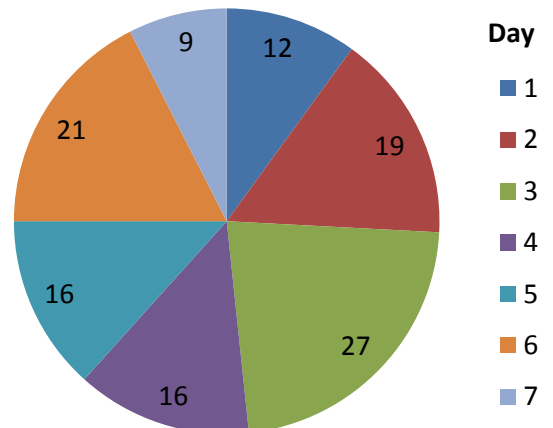
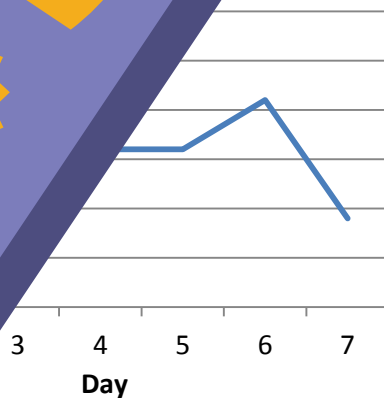
Q7

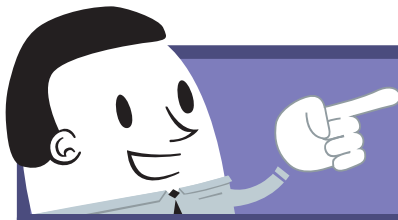
Over the seven days Leon stayed in the Amazon, he observed different species of animals, from sloths to leopards. He recorded the number of different species he saw in a table, picture, and bar chart. Some of the pictures do not match the data in the table.

Day	1	2	3	4	5	6	7
Species Observed	12	19	21	16	27	16	9



Stem	Leaf
0	9
1	2 6 6 9
2	1 7

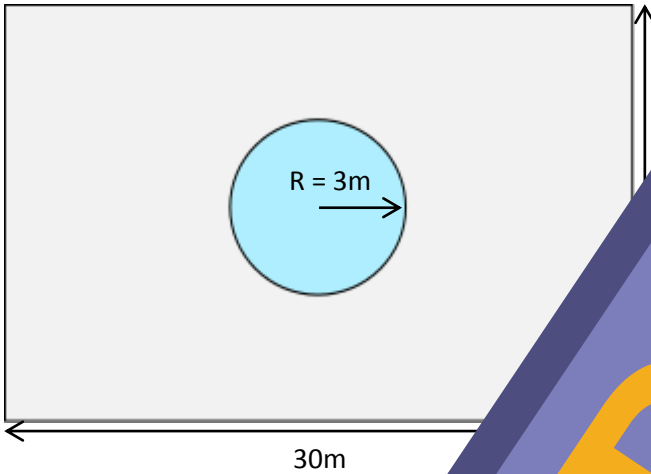




Practise Questions

Q8

Pictured below is a birdseye view of Plaza Mayor – the main square in Peru's capital, Lima. In its centre lies a fountain. Calculate the area of the square of Plaza Mayor that is shaded, i.e. the visible part of the square of Plaza Mayor.



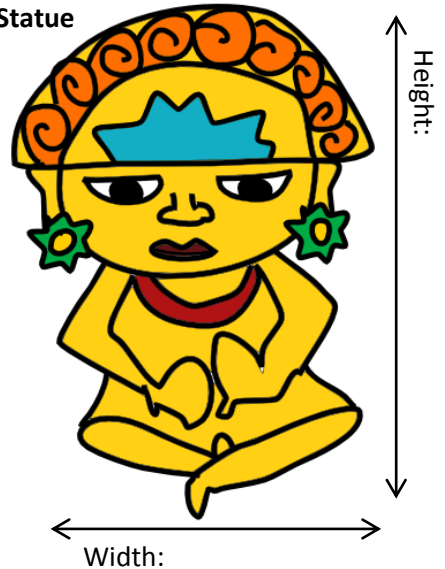
Q9

Museo Banco Central de Reserva del Perú features a collection of archaeological artifacts, including a small scale model of a giant gold statue of a seated figure. Calculate the area of the statue and its scaled down version. Lines have been provided for your working out.

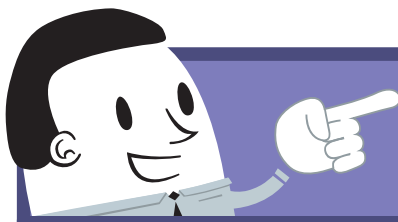
Model Statue



Original Statue



Leon's home town of Brisbane, Australia. If he leaves Brisbane on Monday night and the flight to Lima takes 17 hours, at what time and date will Leon arrive in Peru?



Practise Questions

Q11

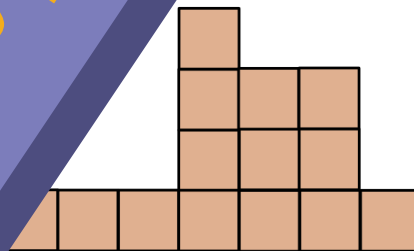
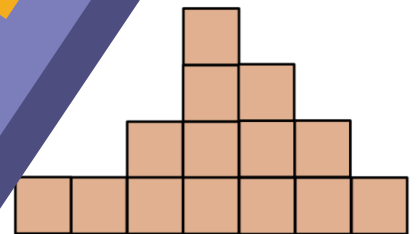
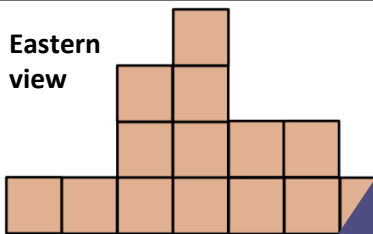
1 Australian dollar (1AUD or \$1) is equal to roughly 2.8 Pennies (2.8PEN or S/2.8). If a hotel in the coastal party town Asia costs S/72 per night, how much does it work out to be in Australian dollars per night?



Q12

1 Australian dollar (1AUD or \$1) is equal to roughly 2.8 Pennies (2.8PEN or S/2.8). If a hotel in the coastal party town Asia costs S/72 per night, how much does it work out to be in Australian dollars per night?

Eastern view

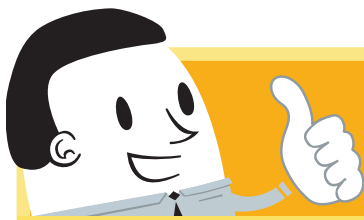


Q13

Wendy is running a raffle to win a free paraglide for two off the beach. Wendy buys 20 and his friend Carlin buys 12. What is the probability of winning the raffle? Express as a fraction and percentage, and use a word describing their chances of success.



Unlikely Likely Even Chance Possible Unlikely Impossible



Practise Questions

Leon is planning a holiday to Peru. When trying to budget for his itinerary, he has become stuck on a collection of maths problems.



Q1

Peru's currency is called nuevo sol. There are 100 centimos in a nuevo sol. Leon has some 50 centimo pieces. Leon has some 20 centimo pieces. Their total value is 1 nuevo sol and 70 centimos. How many 50 centimo pieces does he have?

50 centimo coins = a; Let the number of 20 centimo coins = b
 $50a + 20b = 170$ where $a = 7 - b \rightarrow 50(7 - b) + 20b = 170$
 $(50 \times 7) + (50 \times -b) + 20b = 170 \rightarrow 350 + -50b + 20b = 170 \rightarrow 350 - 30b = 170$
 $350 = 170 + 30b \rightarrow 350 - 170 = 30b \rightarrow 180 = 30b \rightarrow b = 6$
If $b = 6$, $6 = 20$ centimo coins. Because there are 6 20 centimo coins, there is one 50 centimo.
Therefore Leon has six 20 centimo coins and one 50 centimo coin.

Q2

Leon wants to hike to the site located in Cusco that is raised 2430m above sea level. In the diagrams below, calculate their value. Is the angle acute, right or obtuse.



$75^\circ = \text{acute angle}$

$\theta = 101^\circ = \text{obtuse angle}$

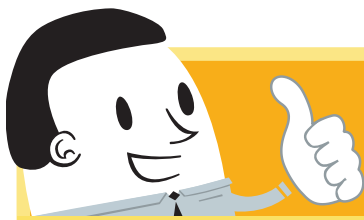


Leon will spend 30 days in the country for a total of 30 days. He will spend 5 days in Aguas Calientes, 3 days in Iquitos, 7 days in the Amazon, and 15 days in Asia. Express the time he will spend in each area as a percentage.

Amazon - $\frac{7}{30} = 23.33\%$
Mancora - $\frac{4}{30} = \frac{2}{15} = 13.33\%$
Aguas Calientes - $\frac{5}{30} = \frac{1}{6} = 16.67\%$
Asia - $\frac{15}{30} = \frac{1}{2} = 50\%$

Tip

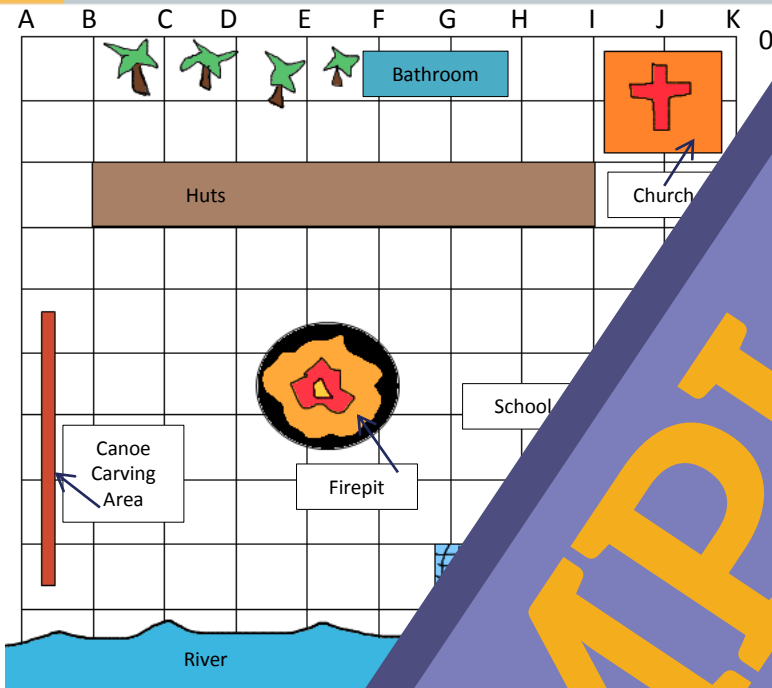
If necessary, round your answers to two decimal places.



Practise Questions

Q4

Below is a map of the Amazon Village Nuevo Loreto . Examine the map and answer the questions on the lines underneath.



from

between J8 and

bal

ar (in metres) is it from the
to the river?

5m

Q5

Leon is tossing up whether to travel independently or as part of a tour. He wants to stay in the village for 3 nights, meaning he would need breakfast, lunch and dinner for every feature offered by Adventure Tours. He can choose to hire everything himself less expensively or to go with the tour. The costs are listed below. Which would work out to be cheaper?

Includes:

- 3 nights
- Canoe
- ...
- ...

Independent Travel

- Rupa Wasi Eco Lodge = \$41 per night.
- One way bus ticket = \$4.50
- Entry to Machu Picchu = \$40
- Guided tour of Machu Picchu = \$20
- Each meal = roughly \$15
- Entry to the Hot Springs = \$10



$\$15 \times (4 \times 3) \text{ meals} = \180

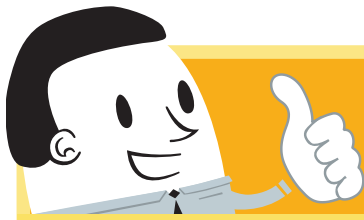
$= \$9$

$\$10 \text{ hot springs}$

Total: $123 + 9 + 40 + 20 + 180 + 10 = \382

Independent travel would be cheaper.





Practise Questions

Q6

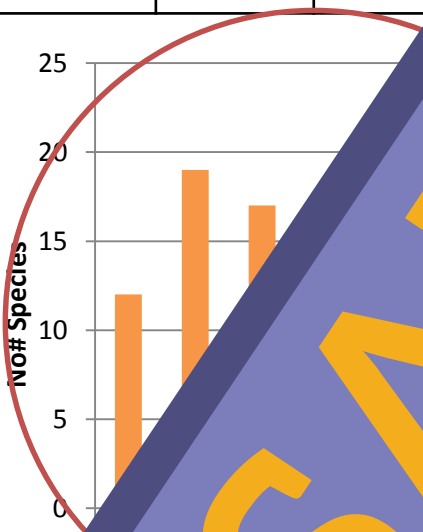
The most visited destination in Peru is the Temple of the Sun where people celebrate and worship Inti, an important Incan god. While Leon notices a pattern on the brick that has worn away at different places.



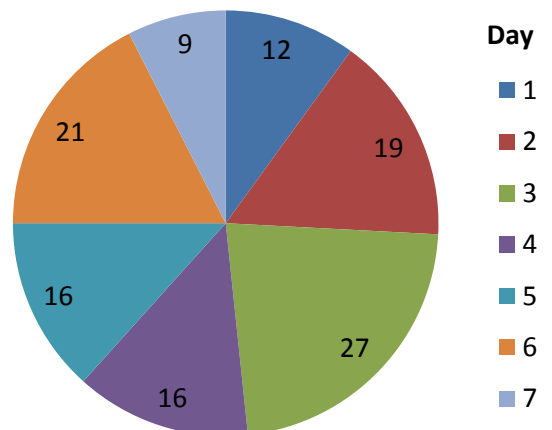
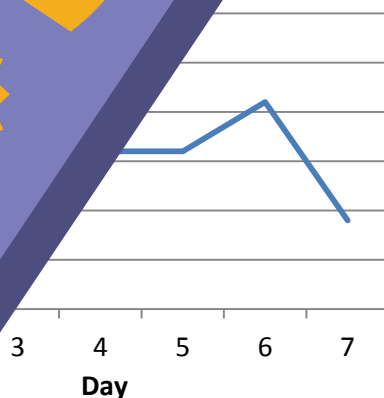
Q7

Over the seven days Leon stayed in the Amazon, he observed different species of animals, from sloths to leopards. He recorded the number of different species he saw in a table, picture, and graph. One of the pictures does not match the data in the table.

Day	1	2	3	4	5	6	7
Species Observed	12	19	21	16	27	16	9



Stem	Leaf
0	9
1	2 6 6 9
2	1 7

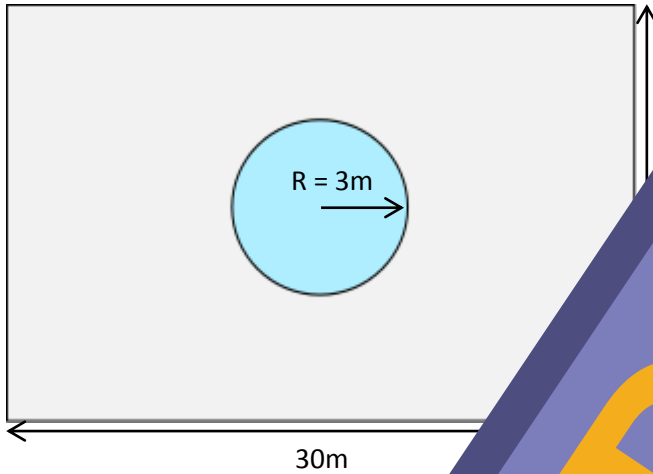




Practise Questions

Q8

Pictured below is a birdseye view of Plaza Mayor – the main square in Peru’s capital, Lima. In its centre lies a fountain. Calculate the area of the shaded part of the square Plaza Mayor that is shaded, i.e. the visible part of the square of the Plaza Mayor.



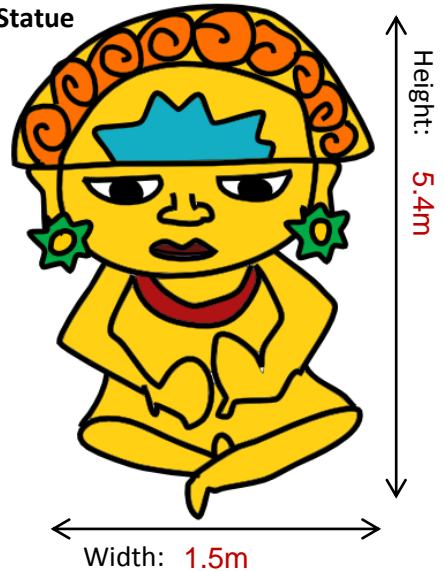
Q9

The Museo Banco Central de Reserva del Perú features a collection of archaeological artifacts. One of the artifacts is a small scale model of a giant gold statue. The statue is a seated female figure. Calculate the area of the statue and its scaled down version. Lines have been provided for your working out.

Model Statue



Real Statue



1.8×3

$.5 \times$



Leon’s home town of Brisbane, Australia. If he leaves Brisbane on Monday night and the flight to Lima takes 17 hours, at what time and on what day will Leon arrive in Peru?

10pm Tuesday

Leon will arrive in Peru on

10pm Monday.

Monday at 10pm Lima time.



Practise Questions

Q11

1 Australian dollar (1AUD or \$1) is equal to roughly 2.8 Pennies (2.8PEN or S/2.8). If a hotel in the coastal party town Asia costs S/720 per night, how much does it work out to be in Australian dollars per night?

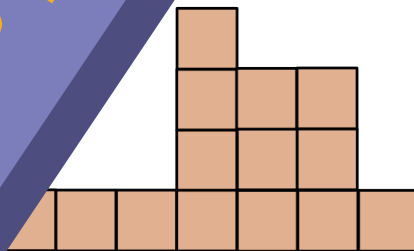
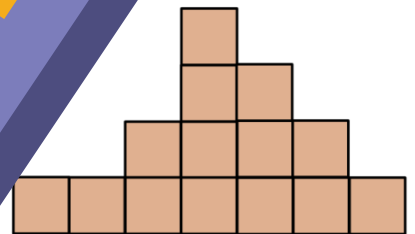
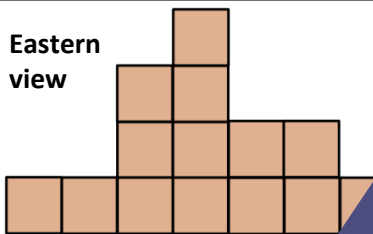
$$S/720 \div 2.8 = S/360 \text{ per night.}$$

$$360 \div 2.8 = \$128.57 \text{ per night.}$$

Q12

1 Australian dollar (1AUD or \$1) is equal to roughly 2.8 Pennies (2.8PEN or S/2.8). If a hotel in the coastal party town Asia costs S/720 per night, how much does it work out to be in Australian dollars per night?

Eastern view



Q13

Wendy is having a raffle to win a free paraglide for two off the beach. Wendy buys 20 and his friend Carlin buys 12. What is the probability of winning the raffle? Express as a fraction and percentage, and use a word describing their chances of success.



Unlikely

Likely

Even Chance

Possible

Unlikely

Impossible



Practise Questions

Question One:

To solve this algebra problem, students needed to assign the unknowns, then needed to write and solve simultaneous equations to obtain the answer. The solution is provided below.

Model response:

Let the number of 50 centimo coins = a ; Let the number of 20 centimo coins = b .
Therefore, $a \times 50 + b \times 20 = 170$ centimos, or $50a + 20b = 170$.
This equation has two unknown variables. In order to solve for the number of unknowns to one.
Because there are seven coins in total, we have $a + b = 7$.
If $a + b = 7$, then $a = 7 - b$.

This value for a can now be substituted into the first equation, leaving the only unknown.
 $50a + 20b = 170$ where $a = 7 - b \rightarrow 50(7 - b) + 20b = 170$
Expand and gather like terms: $(50 \times 7) - 50b + 20b = 170 \rightarrow 350 - 50b + 20b = 170$
 $\rightarrow 350 - 50b + 20b = 170 \rightarrow 350 - 30b = 170$
Isolate b by balancing the equation: $350 - 30b = 170 \rightarrow -30b = 170 - 350 \rightarrow -30b = -180 \rightarrow 180 = 30b \rightarrow 6 = b$.
If $b = 6$, this means there are 6 20 centimo coins. Since there are seven in total, and $7 - 6 = 1$,
there must be one 50 centimo coin.
Check to see if they add up: $1 \times 50 + 6 \times 20 = 50 + 120 = 170$ centimos
 $= 1$ nuevo sol 70 centimos.
Therefore Leon has 1 50 centimo coin.

Question Two:

Here students needed to use the value of missing angles and identify whether they were acute, obtuse or right. The solution is provided below.

Model response:

$\beta: 79^\circ$ and $\alpha: 11^\circ$. $79 + 11 = 90^\circ$. 90° is a right angle.
 $\theta: 75^\circ$ and $\phi: 10^\circ$. $75 + 10 = 85^\circ$. 85° is an acute angle.
 $\gamma: 75^\circ$ and $\delta: 10^\circ$. $75 + 10 = 85^\circ$. 85° is an acute angle.
 $\alpha: 11^\circ$ and $\beta: 79^\circ$. $11 + 79 = 90^\circ$. 90° is a right angle.
 $\theta: 75^\circ$ and $\phi: 10^\circ$. $75 + 10 = 85^\circ$. 85° is an acute angle.



Students needed to change the information given in the word problem to fractions and then convert them to their lowest common form by dividing both the numerator and denominator by their common factor. They then should have been able to convert each fraction to a decimal by dividing the numerator by the denominator and multiplying the answer by 100. The solution is provided overleaf.

This teacher's answer guide is continued on the next page...





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Question Three (cont'd):

Model response:

Lima:

Fraction = $\frac{5}{30} \rightarrow$ Highest common factor of 5

Percentage = $\frac{5}{30} \times 100 = 16.67\%$

Cusco:

Fraction = $\frac{6}{30} \rightarrow$ Highest common factor of 6

Percentage = $\frac{6}{30} \times 100 = 20\%$

Aguas Caliente:

Fraction = $\frac{2}{30} \rightarrow$ Highest common factor of 2

Percentage = $\frac{2}{30} \times 100 = 6.67\%$

Iquitos:

Fraction = $\frac{3}{30} \rightarrow$ Highest common factor of 3

Percentage = $\frac{3}{30} \times 100 = 10\%$

Amazon:

Fraction = $\frac{7}{30} \rightarrow$ No common factor

Percentage = $\frac{7}{30} \times 100 = 23.33\%$

Mancora:

Fraction = $\frac{4}{30} \rightarrow$ Highest common factor of 2 $\rightarrow \frac{4 \div 2}{30 \div 2} = \frac{2}{15}$

Percentage = $\frac{2}{15} \times 100 = 13.33\%$

Asia:

Fraction = $\frac{3}{30} \rightarrow$ Highest common factor of 3 $\rightarrow \frac{3 \div 3}{30 \div 3} = \frac{1}{10}$

Percentage = $\frac{1}{10} \times 100 = 10\%$

By drawing a map, showing direction and scale, students should have been able to answer the question. The correct responses are provided below.



the firepit.

er goal.

quares from the church, and with a scale of 1:5, this meant in real life it

This teacher's answer guide is continued on the next page...





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Question Five:

Students should have calculated the cost of doing Machu Picchu with the cost of the Adventure Tour to work out which option is provided below.

Correct response:

Accommodation = $\$41 \times 3 \text{ nights} = \123

Bus transfers = $\$4.50 \times 2 \text{ ways} = \9

Entry to Machu Picchu = $\$40$

Guided tour of Machu Picchu = $\$20$

Meals = $3 \text{ meals per day for four days} = \180

Entry to the hot springs = $\$10$

Total: $123 + 9 + 40 + 20 + 180 + 10 = \382

Therefore independent travel would be more expensive.

Question Six:

Here, students should have identified the pattern in the numbers and continued it accordingly. The correct response is 36.

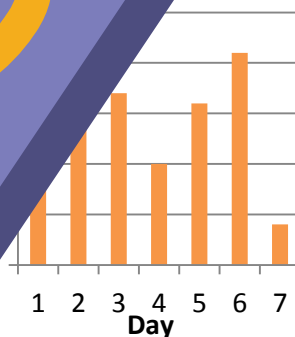
Correct response:

1, 4, 9, 16, 25, 36

Question Seven:

Students should have identified the data displayed in the one-way table and from that identified that the graph was not an accurate reflection of it. The incorrect graph was the one provided below.

Correct response:



This teacher's answer guide is continued on the next page...





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Question Eight:

In this question, students were asked to calculate the shaded area. The diagram provided below.

Correct answer:

$$\begin{aligned}\text{Area of rectangle} &= L \times W \\ &= 30 \times 18 \\ &= 540\text{m}^2\end{aligned}$$

$$\begin{aligned}\text{Area of circle} &= \pi r^2 \\ &= \pi 32 \\ &= 28.27\text{m}^2\end{aligned}$$

$$\begin{aligned}\text{Area of plaza} &= 540 \\ &= 511.73\text{m}^2\end{aligned}$$

Question Nine:

Based on their understanding of scale, students were able to calculate the real-life dimensions of a statue with a scale version and the scale used. The correct answer has been provided below.

Correct answer:

Small statue width

Small statue height

Scale = 1:3

Real statue width

Small statue height



Students were able to calculate an elapsed time between different time zones. The correct answer has been provided below.

1 hour flight = 1pm arrival in Lima in Brisbane time.
- 15 hours = Lima time = 10pm Monday.

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Question Eleven:

Students should have been able to calculate a rate in a question. The correct answer is provided below.

Correct answer:

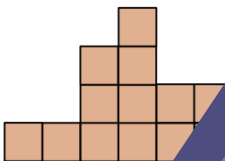
If a hotel in Asia costs S/720 for two nights, 1 night costs S/360.
If \$1 = S/2.8, S/360 in \$AUD = $360 \div 2.8 = \$128.57$

Question Twelve:

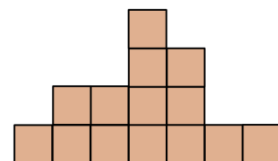
In this item, students were asked to identify a shape from another angle. In this instance, the answer would be the same as the original image, as it was viewed from the eastern side. The correct response is provided below.

Correct response:

Eastern view



Western view



Question

Students should have been able to calculate the chance of an event occurring as a fraction, a percentage, or a decimal. The correct answer has been provided below.

Correct



Factor of 32 and 100 = 4 $\rightarrow \frac{32 \div 4}{100 \div 4} \rightarrow \frac{8}{25}$ chances of winning.

