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WORK SAMPLE PORTFOLIO

Annotated work sample portfolios are provided to support implementation of the Foundation – Year 10 Australian Curriculum.

Each portfolio is an example of evidence of student learning in relation to the achievement standard. Three portfolios are available for each achievement standard, illustrating satisfactory, above satisfactory and below satisfactory student achievement. The set of portfolios assists teachers to make on-balance judgements about the quality of their students' achievement.

Each portfolio comprises a collection of students' work drawn from a range of assessment tasks. There is no pre-determined number of student work samples in a portfolio, nor are they sequenced in any particular order. Each work sample in the portfolio may vary in terms of how much student time was involved in undertaking the task or the degree of support provided by the teacher. The portfolios comprise authentic samples of student work and may contain errors such as spelling mistakes and other inaccuracies. Opinions expressed in student work are those of the student.

The portfolios have been selected, annotated and reviewed by classroom teachers and other curriculum experts. The portfolios will be reviewed over time.

ACARA acknowledges the contribution of Australian teachers in the development of these work sample portfolios.

THIS PORTFOLIO: YEAR 7 MATHEMATICS

This portfolio provides the following student work samples:

Sample 1	Number and algebra: Algebra and the Cartesian plane
Sample 2	Number: Integers
Sample 3	Number: Indices
Sample 4	Geometry: Geometry Review
Sample 5	Geometry: Emily's castle
Sample 6	Geometry: Build the structure
Sample 7	Statistics and probability: Assessment task

This portfolio of student work represents numbers using variables, connects the laws and properties for numbers to algebra and evaluates algebraic expressions after numerical substitution (WS1). They represent authentic information using linear models, and represent and plot points on the Cartesian plane (WS1). The student solves problems involving the comparison, addition and subtraction of integers (WS2). They interpret different views of three-dimensional objects (WS5, WS6).

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They use index notation to represent the prime factorisation of whole numbers and recognise the relationship between perfect squares and square roots (WS3). They classify triangles and describe quadrilaterals, solve simple numerical problems in geometry, including those involving angles formed by transversals crossing pairs of parallel lines (WS4). The student determines the sample space for simple experiments with equally likely outcomes and assigns probabilities to those outcomes (WS7). They construct stem-and-leaf plots and dot plots, calculate the mean, mode, median and range for data sets and interpret these statistics in the context of the data (WS7).

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Number and algebra: Algebra and the Cartesian plane

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.*
>
> *Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.*

Summary of task

Students had completed units of work on algebra and the Cartesian plane. The task consisted of a series of written questions on the topic and students were asked to complete the task under test conditions in a lesson.

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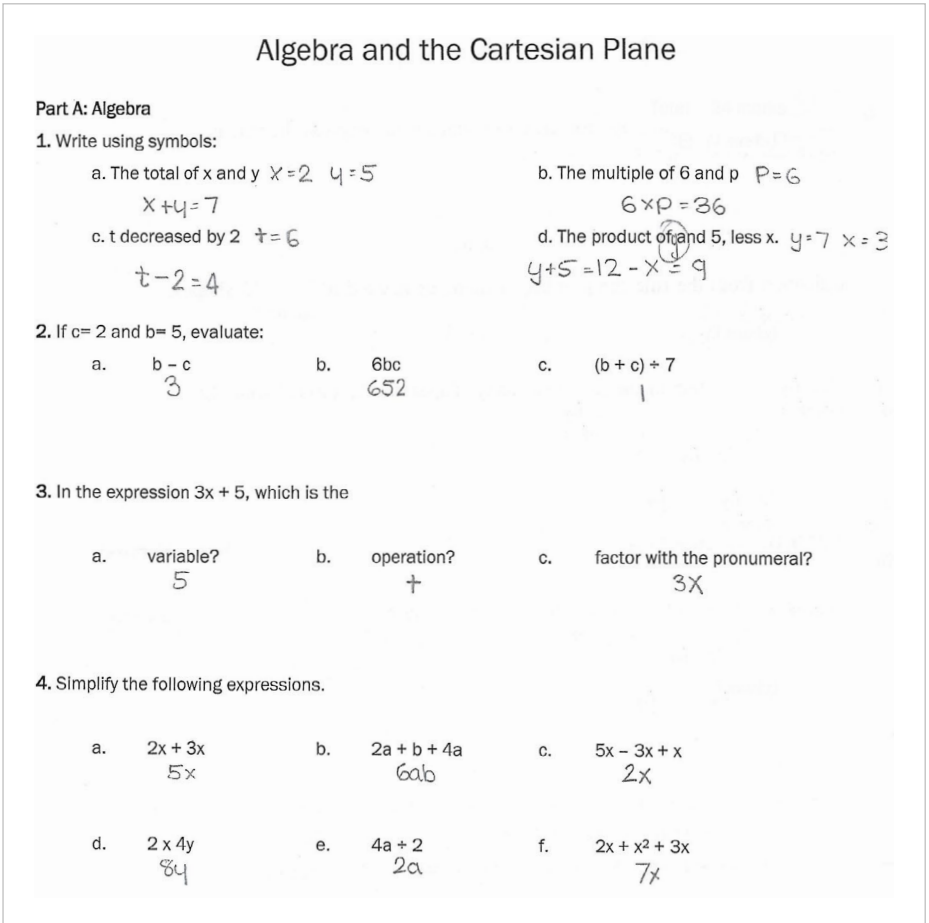
Number and algebra: Algebra and the Cartesian plane



Algebra and the Cartesian Plane

Part A: Algebra

1. Write using symbols:

a. The total of x and y $x=2$ $y=5$ $x+y=7$

b. The multiple of 6 and p $P=6$ $6 \times P = 36$

c. t decreased by 2 $t=6$ $t-2=4$

d. The product of and 5, less x. $y=7$ $x=3$ $y+5=12-x=9$

2. If c= 2 and b= 5, evaluate:

a. b – c 3

b. 6bc 652

c. (b + c) ÷ 7 1

3. In the expression 3x + 5, which is the

a. variable? 5

b. operation? +

c. factor with the pronumeral? 3X

4. Simplify the following expressions.

a. 2x + 3x 5x

b. 2a + b + 4a 6ab

c. 5x – 3x + x 2x

d. 2 x 4y 8y

e. 4a ÷ 2 2a

f. $2x + x^2 + 3x$ 7x

Annotations

Demonstrates some understanding of mathematical terminology when writing algebraic representations of word phrases but replaces variables with values.

Substitutes values for variables to evaluate some simple algebraic expressions correctly.

Distinguishes between variables and operations.

Simplifies some algebraic expressions but does not always collect like terms correctly.

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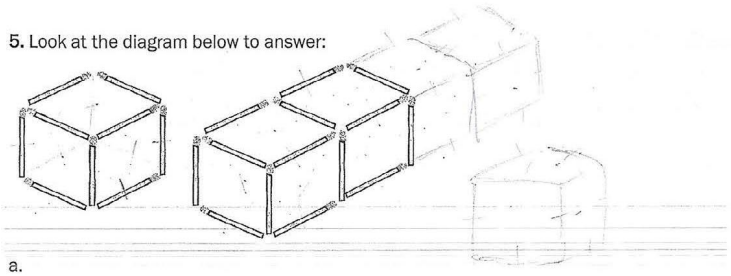
Number and algebra: Algebra and the Cartesian plane

5. Look at the diagram below to answer:



a.

Draw up a table showing number of shapes and number of matches used.

Shapes	Matches
8	23

b.

Select pronumerals to stand for the two variables and express the rule in algebraic form. 8 = x 23 = 4

4 ÷ x / x = 4

c.

Calculate from the rule the number of matches needed to form 15 shapes.

42 matches

d.

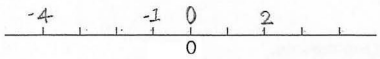
Find by substitution in the rule how many shapes can be formed from 49 matches.

15 shapes can be made.

PART B: The Cartesian Plane

1. Graph the set of numbers onto the number line given

{2, -1, -4, 0}



2. Penny checks her bank account balance and it reads $ - 240.00 .
   a. What does this mean for Penny? She has -240.00 dollars
   b. If she deposits $40, what is her new balance? $ - 200.00

Annotations

Indicates the total number of shapes and the total number of matches used, but does not recognise the intent of the question.

Locates integers on a number line.

Solves a simple problem involving integers.

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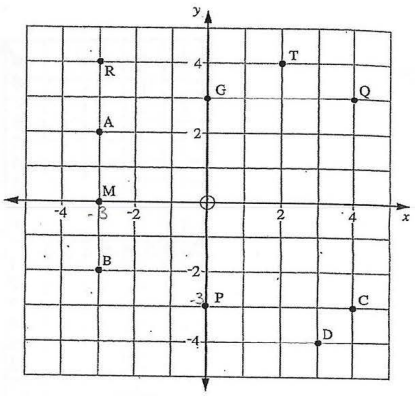
Number and algebra: Algebra and the Cartesian plane

3. Using the number plane below, write the coordinates for the following letters:

a. T (2,4)
b. A (-3,2)
c. C (4,-3)
d. P (0,-3)
e. M (-3,0)

x, y

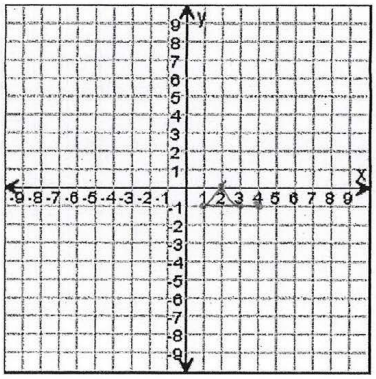


4. a. Complete the table of values using the rule given

$y = x + 2$

x	-1	0	1	2
y	1	2	3	4

b. Plot these coordinates on the grid below to graph the straight line



Annotations

States the coordinates of points on the Cartesian plane using the correct notation.

Uses an algebraic rule to complete a table of values.

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Number: Integers

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.

Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.

Summary of task

Students were asked to complete a quiz in class after completing a revision of integers and their application in authentic situations.

Number: Integers

Integers

Integers are all of the positive and negative whole numbers including zero.

A number line is very useful when working with integers.

1. Draw a number line from -10 to +10

As you move right along the number line, the numbers ascend or get larger.

2. Arrange the following integers in ascending order:

   a. ~~8, -3, 6, 0, 2, -4, -7~~ -7, -4, -3, 0, 2, 6, 8

   b. 34, 23, -6, 4, -65, 3, -63 -65, -63, -6, 3, 4, 23, 34

3. Samantha was keeping score for a card game she and her friends were playing. The scores are listed below. Rank each player according to their score from lowest score to highest score.

   ~~Jack -100, Josh 200, Casey -500, Claire -50,~~ Chris 1500, Blake 1600 and ~~Lara -10~~

   -10, -50, -100, -500, 200, 1500, 1600

4. Write '>' or '<' to make the following statements correct.

   a. -32 < -35

   b. 0 > -4

   c. -7 > -10

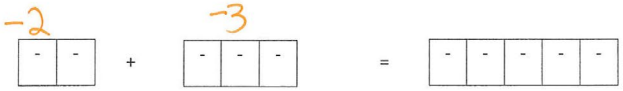
   d. 12 > -29

Adding and Subtracting Integers

ADDITION

-2 + (-3) = **-5**

2 negatives plus 3 negatives equals 5 negatives.



5. The above example shows you the result of -2 + (-3). What addition rule do you learn from the above example? When there are two -'s it equals plus.

Annotations

Orders integers on a line.

Orders integers from smallest to largest.

Compares integers using mathematical symbols.

Number: Integers

6. Calculate the following using a number line.

a. -7 + 5 = -2

b. 4 + (-8) = -4

c. -24 + 34 =

d. -8 + 8 = 16

e. 11 + (-6) = 17

f. -7 + (-10) =

g. 5 + (-5) = 10

h. -6 + 7 + (- 4) =

SUBTRACTION

When you subtract integers, think of the problem as 'take – away'.

-4 – (-2) = **-2**

4 negatives take away 2 negatives equals 2 negatives.

-	-	-	-	- (take – away)	-	-	=	-	-

7. The above example shows you the result of -4 – (-2). What subtraction rule do you learn from the above example? Because you add a pair.

8. Calculate the following using a number line.

a. 6 – (-5) = -1 11

b. 18 – (-10) = 28

c. -3 – (-3) = 0

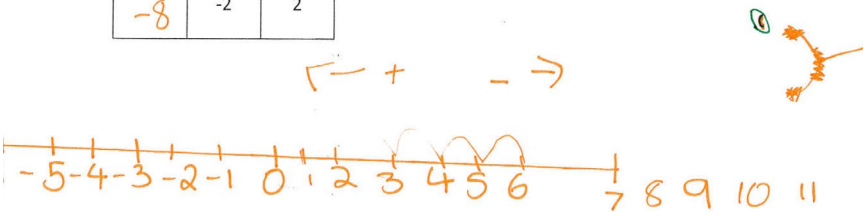
d. -2 – (-13) = 15

e. 6 – (-3) – 7 = 2

f. 13 – 20 – (-5) = 3

9. Complete the magic square.

-4	13	-7
-6	-1	-5
-8	-2	2



Annotations

Subtracts integers with some errors.

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Number: Integers

10. The temperature in Canberra at midday was 12°C. By midnight it had dropped to -5°C. By how much did the temperature drop?

-17° C

11. What is the combined effect of a gain in weight of 5 kg and then a loss of 12 kg?

7KG

12. What will be the net result if Tara deposits $400 in her account followed by a withdrawal of $700?

-$300

Annotations

Demonstrates some understanding when solving word problems involving integers.

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Number: Indices

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

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Summary of task

Students had completed a unit of work on indices with whole numbers, including writing whole numbers as a product of their prime factors, the connection between perfect squares and square roots, and the calculation of square roots of whole numbers.

Students were asked a series of questions that involved identifying factors of numbers, calculating perfect squares and their squares roots, and finding the greatest common divisor (highest common factor) using whole numbers written as a product of their prime factors. The use of calculators was not permitted and students were given 25 minutes of class time to complete the task.

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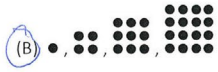
Number: Indices

Indices **Calculators are NOT permitted**

1) Which dot pattern represents the first four square numbers? Circle the correct answer.

(A) 

(B) 

(C) 

(D) 

2) In the expression 5^{20}, what is the mathematical term used to describe the numeral 5? Circle the correct answer.

(A) base (B) bottom (C) index (D) power

3) Write down any two square numbers that are larger than 60: 81 and 100

4) Write down all the factors of each number.

a) 48 1, 2, 4, 6, 8, 12, 24, 48

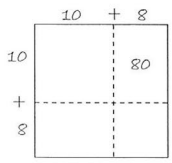
b) 66 1, 2, 3, 6, 11, 22, 33, 66

5) What is the highest common factor of 48 and 66? 6

6) Write down 7^8 in expanded form (ie without index notation). You do not need to evaluate the expression.

7 x 7 x 7 x 7 x 7 x 7 x 7 x 7

7) To work out the value of 18^2, Anh drew a diagram. Part of his diagram is shown below.



a) Place the correct value in each part of the diagram.

b) Write down a numerical expression that shows how the diagram can be used to evaluate 18^2 and use this to find the value of 18^2.

Annotations

Identifies a visual representation of square numbers.

Identifies the correct mathematical term related to index notation.

States two square numbers.

Identifies factors of numbers and writes them in ascending order but omits the factor pair 3 × 16 of the number 48.

Identifies the greatest common divisor (highest common factor) of two given two-digit numbers from lists of their factors.

Shows some understanding of the relationship between the base and the index for a number written in index notation.

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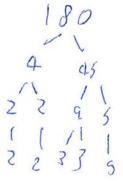
Number: Indices

8) Consider the numbers 180 and 600.

a) Draw a factor tree or factor ladder for the number 180.



b) Use your factor tree or factor ladder to express 180 as a product of its prime factors.

c) Given that $600 = 2^2 \times 3 \times 5^2$, find the highest common factor of 180 and 600.

60

9) Given that $529 = 23^2$, what is the value of $\sqrt{529}$? 66

10) Given that $1764 = 2^2 \times 3^2 \times 7^2$, what is the value of $\sqrt{1764}$? 116

11) Given that $18\,662\,400 = 2^{10} \times 3^6 \times 5^2$, find $\sqrt{18\,662\,400}$. Leave your answer as a product of primes in simplest index form.

12) Jenny wrote:

'All numbers have an even number of factors because factors always come in pairs.'

Is Jenny correct? Give a reason for your answer, and provide at least one example to support your decision.

That is not true because I have worked out numbers that are not all just even.

Annotations

Constructs a factor tree for a three-digit number.

Finds the greatest common divisor (highest common factor) of a pair of three-digit whole numbers.

Comments on the validity of a statement using personal experience to justify their response.

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Geometry: Geometry review

Year 7 Mathematics achievement standard

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Summary of task

Students had completed a unit of work on geometric reasoning.

Students were asked a series of questions that involved applying:

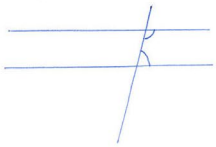
- the angle and side properties to classify triangles and describe quadrilaterals
- the properties of angles on a straight line, angles at a point and vertically opposite angles to solve numerical problems with appropriate reasoning
- the angle relationships formed when parallel lines are crossed by a transversal to solve numerical problems with appropriate reasoning
- the angle sum of a triangle to solve numerical problems with appropriate reasoning.

The use of calculators was permitted and students were given 40 minutes of class time to complete the task.

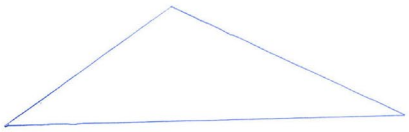
Geometry: Geometry review

Geometry Review

1) Draw and label a pair of **parallel lines** and a **transversal** and clearly indicate the location of **ONE pair of co-interior angles**. Your diagram does not have to be drawn to scale.



2) Make a neat sketch of an **obtuse-angled isosceles triangle**, labelling any equal sides or angles with appropriate symbols.



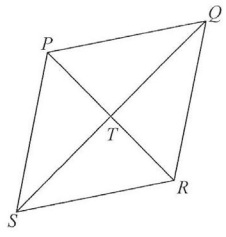
3) Name the **quadrilateral** that has opposite sides are parallel **AND** diagonals that are equal in length.

Name of quadrilateral: Square

4) Can a triangle have **more than one** right angle? Give a reason for your answer.

no

5) Which **one** of these statements about rhombus $PQRS$ is **not true**?



(A) $QS \perp PR$

(B) $PT = TQ$

(C) $PQ = QR$

(D) $\angle PQS = \angle RQS$

(E) $\angle PST = \angle TQR$

(F) $PQ \parallel SR$

Annotations

Draws a pair of lines and indicates the position of a pair of co-interior angles formed by a transversal.

Draws an obtuse-angled triangle.

States a quadrilateral with the given properties but does not provide the more inclusive classification of 'rectangle'.

Provides an answer without justification.

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Geometry: Geometry review

6) Circle **true or false** for each statement.

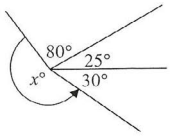
a) All rectangles are squares. true (false)

b) Some rhombuses are parallelograms. (true) false

c) All squares are rhombuses. (true) false

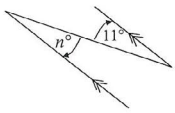
7) Find the **value** of each pronumeral, giving a **reason** for each. [Diagrams are not drawn to scale.]

a)



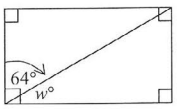
$x =$ 225 [full ... circle ... equals ... 360°]

b)



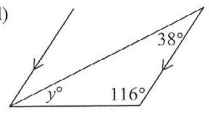
$n =$ 11 [alternate ... angles]

c)



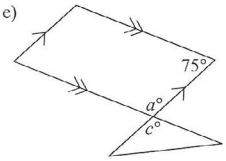
$w =$ 26 [right ... angle ... equals ... 90°]

d)



$y =$ ~~26~~ 36 [area ... of ... a triangle]

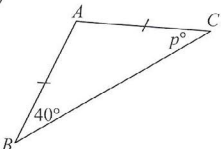
e)



$a =$ 55° [cointerior]

$c =$ 55 [~~alt~~ vertically ... opposite]

f)



$p =$ 40 [equal ... angles ... of ... triangle]

Annotations

Recognises that particular quadrilaterals can be classified in more than one way.

Calculates some correct values in simple numerical problems.

Identifies relevant angle types for some numerical calculations.

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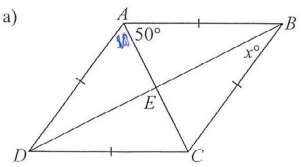
Geometry: Geometry review

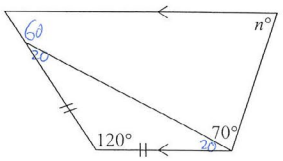
8) Find the value of each pronumeral. Reasons **not** required. [Diagrams are not drawn to scale.]

a)



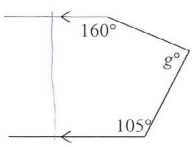
$x =$ _____

c)



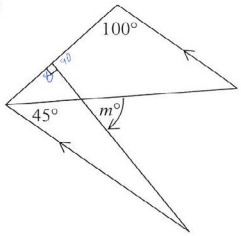
$n = 118$

b)



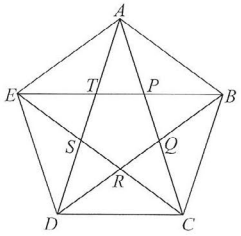
$g = 95$

d)



$m =$ _____

9) The diagram shows the regular pentagon *ABCDE* and all of its diagonals. The diagram IS drawn to scale.



a) Name a pair of parallel lines EB = DC

b) Name a rhombus [illegible] EBCD

c) Name a kite ABRE

d) Name a pair of equal alternate angles EBDC

e) Name a pair of equal corresponding angles ABQC

Annotations

Uses angle relationships to solve a multi-step numerical problem.

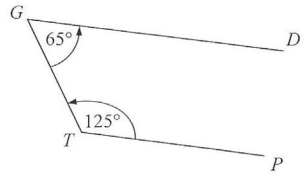
Identifies and names a pair of parallel lines but incorrectly states that they are equal in length.

Mathematics

Year 7
Below satisfactory

Geometry: Geometry review

10) The diagram below is not drawn to scale.

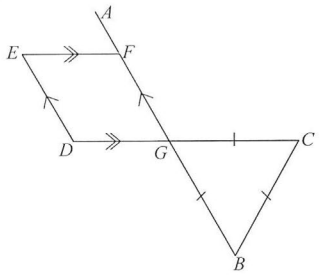


Are the lines DG and PT parallel? Give a reason why or why not.

No, the angles inside equal 180°.

---

11) In the diagram below, AB and DC are straight lines intersecting at the point G. EF is parallel to DC. The diagram is not drawn to scale.



Jamie was asked to find the size of $\angle EFA$ and wrote the following in his workbook.

Complete the gaps in his work.

$\angle CGB = 60°$ [vert. of triangle]

$\angle FGD = 60°$ [vert. of triangle]

$\angle EFA = 60$ [corresponding angles]

Annotations

Determines whether or not a pair of straight lines are parallel.

Applies a sequence of angle properties to obtain an answer to a multi-step numerical problem, identifying one correct angle type.

Geometry: Emily's castle

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.*
>
> *Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.*

Summary of task

Students had completed a unit on geometry that including drawing and interpreting different views of three-dimensional objects. Students learned how to use a virtual drawing tool to construct three-dimensional objects and represent these objects in two dimensions.

In the task, students were asked to:

- draw front, right side and top views of three-dimensional objects constructed from centicubes on square grid paper and also on isometric grid paper
- use a virtual drawing tool to construct a variety of three-dimensional objects (and represent this object in two-dimensions) given a particular set of front, top and side views and certain conditions.

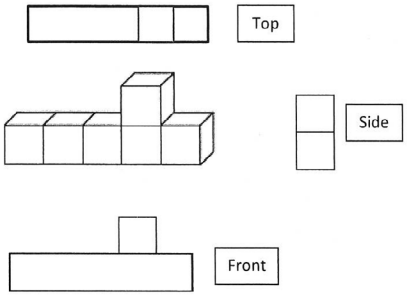
Students were given two lessons with access to the virtual drawing tool to complete the task.

Geometry: Emily's castle

Part A: Knowledge and Understanding

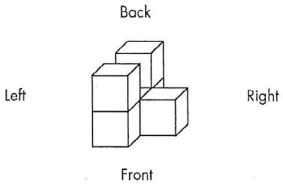
Question One: Front / Side / Top Views of 3 Dimensional Objects

In architecture and many other fields 2 dimensional drawings are used to represent 3 dimensional objects. In this question you are required to draw 2 dimensional drawings which represent what can be seen if you are looking at a 3 dimensional object from either the front, one of the sides, the back or from above the object. An example is shown below.

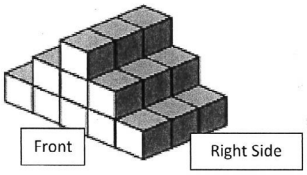


On the square paper provided draw the front, right side and top views of the solids shown.

(a)



(b)

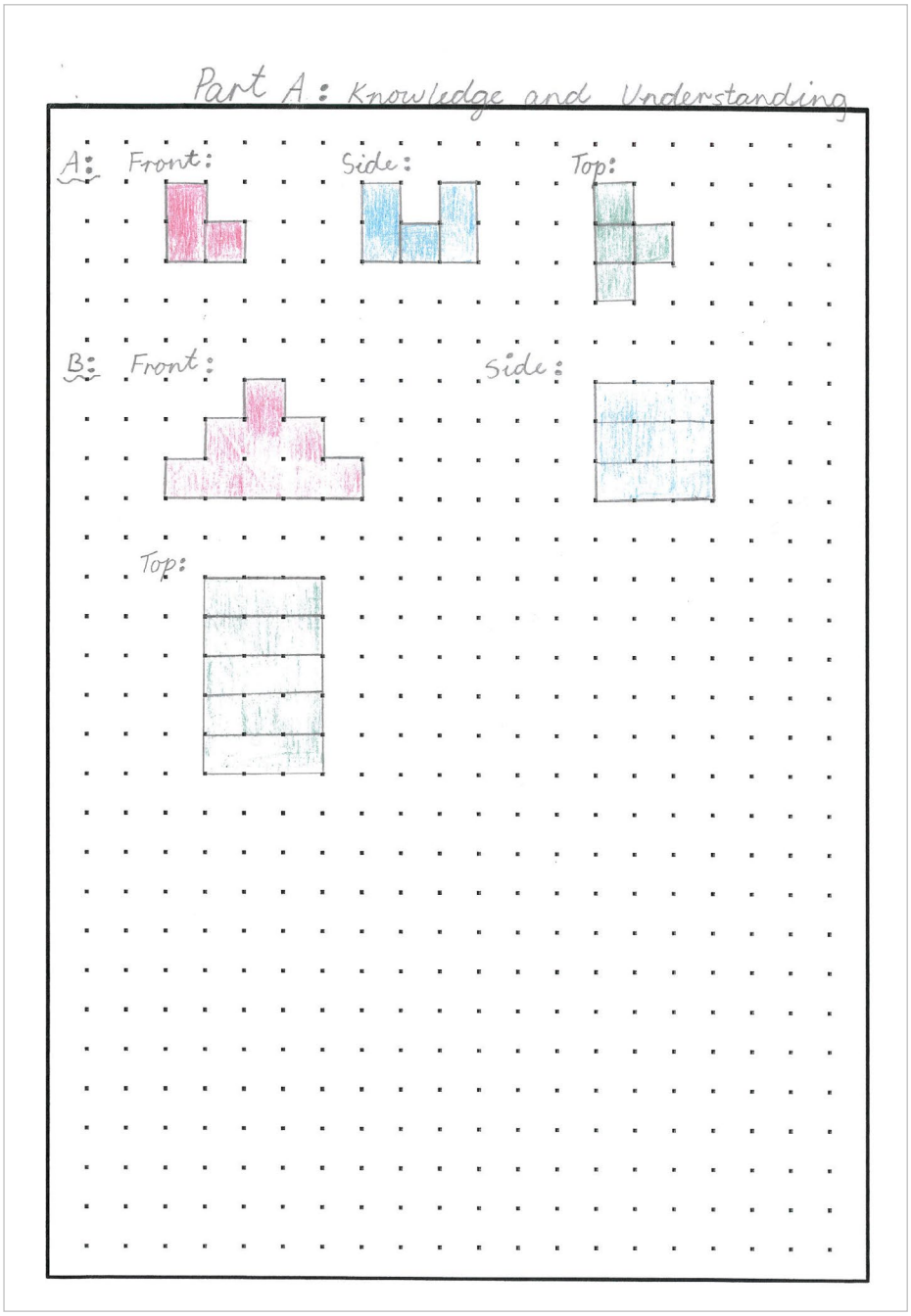


Annotations

Mathematics

Year 7
Below satisfactory

Geometry: Emily's castle



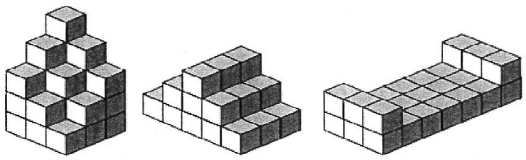
Annotations

Draws different views of a three-dimensional object, indicating changes in height but with one error.

Geometry: Emily's castle

Question Two: Isometric Drawings

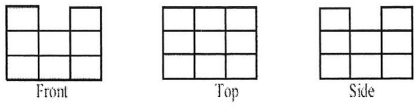
Isometric drawing is a method of representing 3 dimensional objects using 2 dimensions. Use the isometric drawing paper attached to reproduce the drawings below. Use colours to indicate the faces which would appear in the top view, front, right side and left side views. Include a legend with your diagrams.



crystal stairs bed

Part B: Problem Solving and Reasoning

Emily has designed plans for a castle that show the front, top, and side views. Unfortunately she has not used the system of identifying different heights using lines, so you are unable to discern whether or not blocks are on the same or different levels from her digarams.



Front Top Side

Question Three:

What is the largest number of cubes that you can use in the construction of a castle from Emily's plans?

- Clearly explain how you obtained your answer.
- Use the virtual isometric drawing tool provided to draw the castle with the maximum amount of blocks.
- Use the 2-D feature of the drawing tool to show that the top, front and side perspectives are correct.

Question Four:

What is the smallest number of cubes that you can use in the construction of a castle from Emily's plans?

- Clearly explain how you obtained your answer.
- Use the virtual isometric drawing tool provided to draw the castle with the minimum number of cubes.
- Use the 2-D feature of the drawing tool to show that the top, front and side perspectives are correct.

Question Five:

How many symmetrical castles can you build to that satisfy Emily's specifications? [Your solution must be accompanied by an explanation]

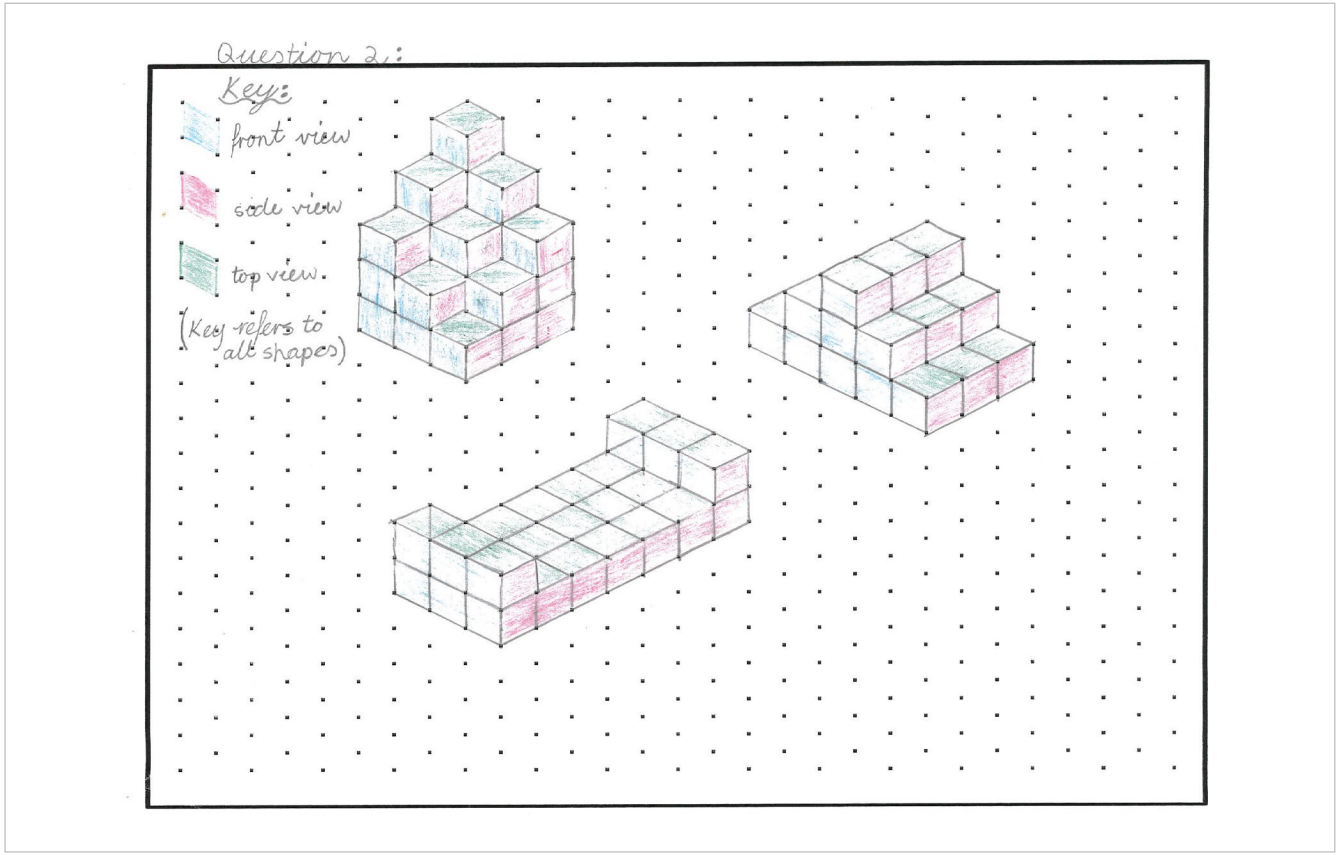
- Use the virtual isometric drawing tool provided to draw the castles which match Emily's design and are symmetrical
- Use the 2-D feature of the drawing tool to show that the top, front and side perspectives are correct.

Annotations

Mathematics

Year 7
Below satisfactory

Geometry: Emily's castle



Annotations

Draws three-dimensional objects on isometric paper, indicating faces but with some unnecessary intervals.

Mathematics

Year 7
Below satisfactory

Geometry: Emily's castle

Maths Assignment

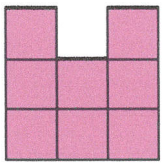
Part B: Problem Solving and Reasoning

Question 3: *What is the largest number of cubes that you can use in the construction of a castles from Emily's plans?*

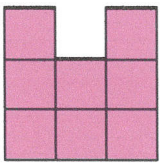
To figure out the largest number cubes that could be used to construct Emily's castle, I added the bottom row of nine cubes, plus the second row of nine and then added the four on top. This resulted in 22 being the largest number of cubes to construct Emily's Castle.

9 + 9 + 4 = 22

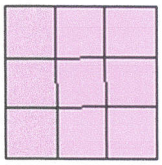
Front View:



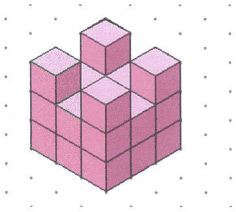
Side View:



Top View:



Virtual isometric drawing:



Annotations

Determines the maximum number of cubes that can be used to construct a three-dimensional object with the required front, top and side views.

Describes how to determine the maximum number of cubes that can be used.

Uses the virtual drawing tool to draw the three-dimensional object and its different views.

Mathematics

Year 7
Below satisfactory

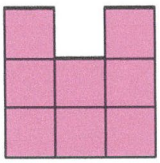
Geometry: Emily's castle

Question 4: What is the smallest number of cubes used that you can use in the construction of a castle from Emily's Plans?

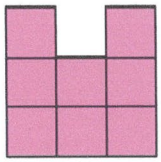
To figure out the smallest number cubes that could be used to construct Emily's castle, I took away 2 cubes overall, but only one per level. So, I added the 8 cubes on the bottom row, plus the eight cubes on the second and then the four cubes on top. This resulted in 20 being the smallest number of cubes to construct Emily's Castle.

$$8 + 8 + 4 = 20$$

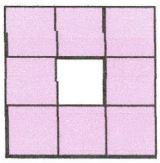
Front View:



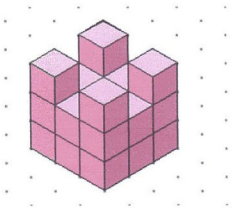
Side View:



Top View:



Virtual isometric drawing:



Annotations

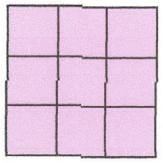
Attempts to determine the minimum number of cubes that can be used to construct a three-dimensional object with the required front, top and side views.

Geometry: Emily's castle

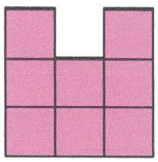
Question 5: *How many symmetrical castles can you build to satisfy Emily's reflection?*

There are 3 castles. I have shown 2 examples in questions 3 and 4, that match Emily's constructions and the drawing tool confirms that. The third example is having 9 cubes on the bottom level and 8 cubes on the second level and then 4 on the top, which also be symmetrical. I have assumed that there can be no unsupported cubes.

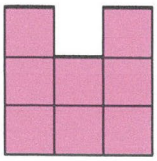
Top View

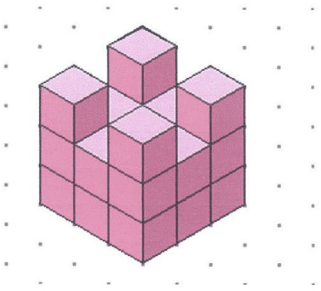


Front View



Side View





Annotations

Provides a limited number of possibilities for three-dimensional objects with the required front, top and side views.

Mathematics

Year 7
Below satisfactory

Geometry: Build the structure

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.*
>
> *Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.*

Summary of task

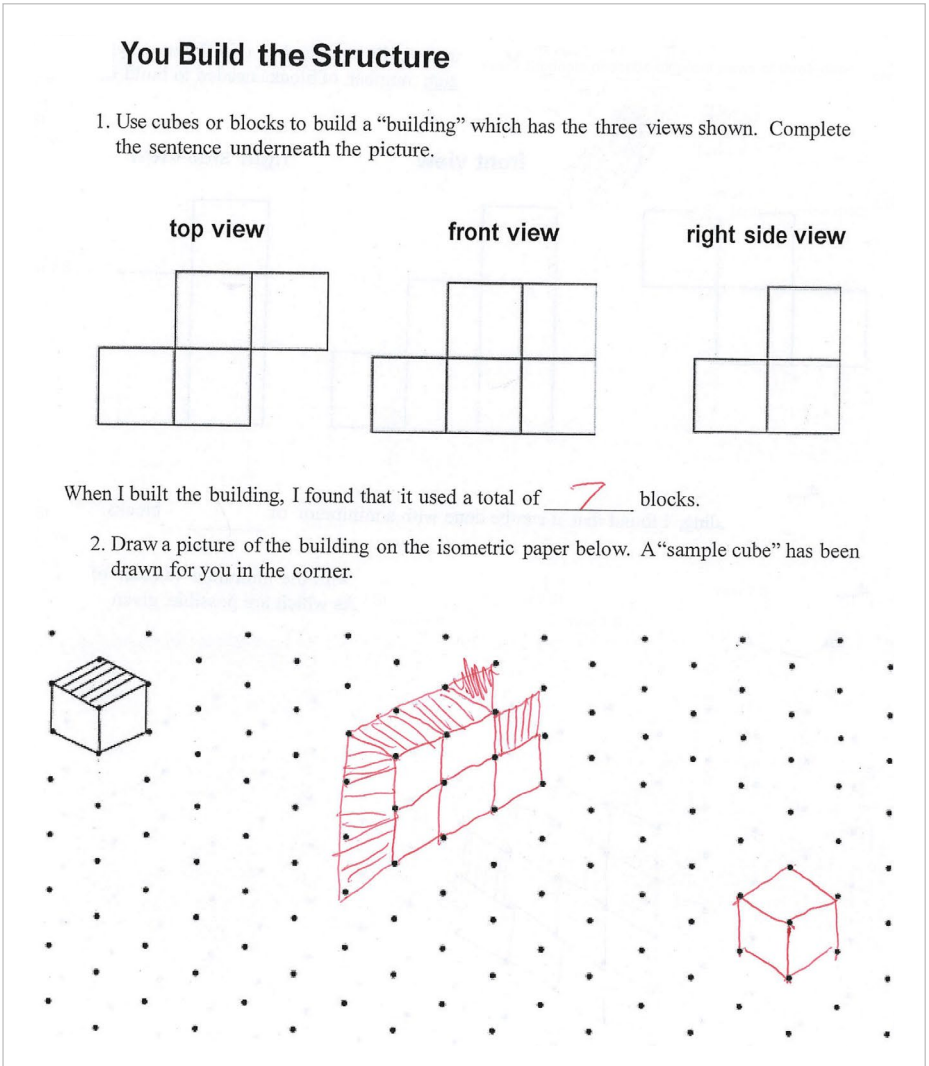
Students were asked to complete an investigation involving building and sketching prisms. They were required to use the different views of a ‘building’ and isometric paper to draw two-dimensional representations of it.

Mathematics

Year 7

Below satisfactory

Geometry: Build the structure



You Build the Structure

1. Use cubes or blocks to build a "building" which has the three views shown. Complete the sentence underneath the picture.

top view

front view

right side view

When I built the building, I found that it used a total of 7 blocks.

2. Draw a picture of the building on the isometric paper below. A "sample cube" has been drawn for you in the corner.

Annotations

Makes an attempt to draw the given prism.

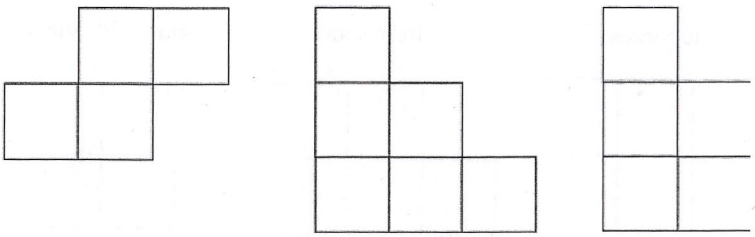
Mathematics

Year 7
Below satisfactory

Geometry: Build the structure

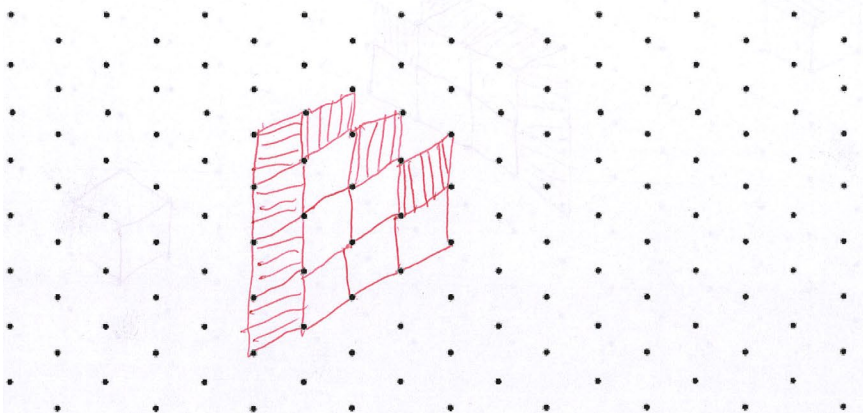
3. Another building, which has the views below, can be built in a number of different ways. By using blocks or cubes, write down the minimum number of blocks needed to build it.

top view | front view | right side view



When I built the building, I found that it can be done with a minimum of 7 blocks.

4. Using a picture on the isometric paper, show the building with the minimum number of blocks, and, in a different colour, show the additional blocks which are possible, given the three views.



Annotations

Identifies the minimum number of blocks to make a three-dimensional object based on different views.

Mathematics

Year 7
Below satisfactory

Statistics and probability: Assessment task

Year 7 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

> *By the end of Year 7, students solve problems involving the comparison, addition and subtraction of integers. They make the connections between whole numbers and index notation and the relationship between perfect squares and square roots. They solve problems involving percentages and all four operations with fractions and decimals. They compare the cost of items to make financial decisions. Students represent numbers using variables. They connect the laws and properties for numbers to algebra. They interpret simple linear representations and model authentic information. Students describe different views of three-dimensional objects. They represent transformations in the Cartesian plane. They solve simple numerical problems involving angles formed by a transversal crossing two parallel lines. Students identify issues involving the collection of continuous data. They describe the relationship between the median and mean in data displays.*
>
> *Students use fractions, decimals and percentages, and their equivalences. They express one quantity as a fraction or percentage of another. Students solve simple linear equations and evaluate algebraic expressions after numerical substitution. They assign ordered pairs to given points on the Cartesian plane. Students use formulas for the area and perimeter of rectangles and calculate volumes of rectangular prisms. Students classify triangles and quadrilaterals. They name the types of angles formed by a transversal crossing parallel line. Students determine the sample space for simple experiments with equally likely outcomes and assign probabilities to those outcomes. They calculate mean, mode, median and range for data sets. They construct stem-and-leaf plots and dot-plots.*

Summary of task

Students had completed a unit of work on statistics and probability. They completed an experimental investigation in class, recorded and graphed results and responded to questions formulated as a short test.

Statistics and probability: Assessment task

Statistics and Probability Assessment Task Year 7

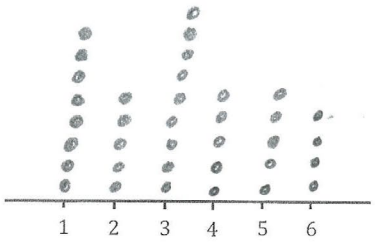
Part A

1. If you were to roll a standard six-sided die 36 times, how many sixes (6's) would you expect to get? 6 times

2. Experiment: Roll a standard six-sided die 36 times and record your results in the table below.

Number	Tally	Total
1	𝍸 |||	8
2	𝍸 "	5
3	𝍸 ||||	9
4	𝍸	5
5	𝍸	5
6	||||	4

3. Graph a dot-plot of your data on the line below.



4. What is the mode of this data? = 3

5. Were the results what you expected? Explain your reasoning.

No they weren't because it was meant to be rolled 6 times, but the results say it was rolled 4 times.

Annotations

Calculates the expected frequency of an outcome in a simple experiment.

Constructs a dot-plot based on data gathered.

Identifies the mode of a data set.

Compares expected frequency with observed frequency.

Mathematics

Year 7
Below satisfactory

Statistics and probability: Assessment task

6. Based on the results of your experiment, calculate the experimental probability (as a fraction) of rolling a:

1 - P(1)= 36
2 - P(2)= 18
3 - P(3)= 12.
4 - P(4)= 9.
5 - P(5)= 7.2
6 - P(6)= 6

Part B

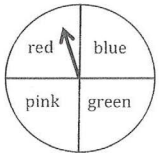
A single coin is tossed.

The sample space is: {Head, Tail}

The probability of tossing a Head is $P(H) = \frac{1}{2}$

The probability of tossing a Tail is $P(T) = \frac{1}{2}$

For the spinner shown:



1. List the sample space

2. What is the probability of spinning red? $\frac{1}{4}$

3. What is the probability of spinning red or blue? $\frac{2}{4}$

4. How could you change the spinner to increase the chance of spinning red? Explain your reasoning.

You could increase the amount to red on the spinner by changing Blue to red.

Annotations

States probabilities in experiments with equally likely outcomes.

Explains how to increase the probability of an outcome in a simple experiment.

Statistics and probability: Assessment task

Part C

A Year 7 Maths class sat a test and the following results were recorded:

42, 36, 23, 40, 18, 49, 51, 54, 38, 33, 35, 47, 29, 31, 15, 48, 59, 3,

1. Complete the stem-and-leaf plot below using the above information.

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

2. What is the range of the results?

39.

3. What is the mode of the results?

29.

4. What is the median of the results?

29

5. What is the mean of the results?

559 ÷ 19 = 29.473684 2.

6. Which measure (mode, median or mean) best represents the results of the class ? Explain your reasoning.

I think range best represents the class results because it shows the difference between the highest and the lowest scores.

Annotations

Constructs an ordered stem-and-leaf plot but does not align the digits of the leaf vertically.

Calculates the range, mode and median of a data set.

Attempts to calculate the mean but makes an error when using their calculator.