JSC Questions Mathematics

Exam questions from 2012 - 2016.
All questions asked in paper 1 and paper 2 appear in this summary.

ACKNOWLEDGEMENT IS GIVEN TO:

MINISTRY OF EDCATION OF THE REPUBLIC OF NAMIBIA

THROUGH DNEA

FOR AVAILING THE QUESTIONS FROM OLD EXAMPAPERS.

The Rössing Foundation

Note for the user: the question are selected from past examination papers and categorized in different sections.

Answers to these questions are also available on the website.

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Content:

Section 1 Calculations; rounding off; standard form and significant figures.

1. [JSC P1 2013 Q1]

Write the following as a decimal fraction, correct to 3 decimal places

(a) $\frac{1}{11}$ [1]

(b) 2.1×10^{-2} [1]

2. [JSC P1 2013 Q2]

Work out $2.1 \times 10^{-2} - 2.1 \times 10^{-3}$; giving your answer in standard form. [2]

3. [JSC P2 2014 Q1]

Work out: **(a)** $5(17 - 4) + 6$ [1]

(b) $64 - \sqrt[3]{27} \times 8$ [1]

4. [JSC P2 2012 Q2]

The temperature was 3°C. It decreases with 7°C. What is the temperature now? [1]

5. [JSC P2 2015 Q3]

The population of Atlanto island is 1 875 000. The area of the Atlanto is 5 000 000 km^2.

(a) Write down the population of Atlanto in standard form. [2]

(b) Work out the population per square kilometres in that country. [2]

6. [JSC P1 2015 Q6]

The mass of a neutron is 1.67×10^{-5} grams. Write the mass as an ordinary number. [1]

7. [JSC P1 2016 Q1]

Write 27.0567 correct to two decimal places. [1]

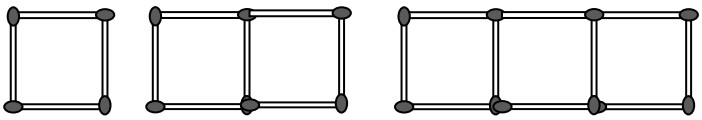
8. [JSC P1 2016 Q3]

Express 2.7×10^{-2} as an ordinary number. [1]

Section 2 Sequences and patterns.

1. [JSC P1 2013 Q2]

Matches are used to make squares to the right.



Complete the table

Number of squares	1	2	3	
Number of matches	4	7		16

[2]

2. [JSC P2 2013 Q3]

(a) (i) Work out $3 \div 3 =$ .....

$(5 + 7) \div 3 =$ .....

$(7 + 9 + 11) \div 3 =$ .....

$(9 + 11 + 13 + 15) \div 3 =$ ..... [2]

(ii) What is the special name given to the answers in **(a) (i)**? [1]

(b) Find x if $x^2 = 1^2 + 4^2 + 8^2$ [2]

3. [JSC P2 2014 Q4]

Fill in **(a)** the next **two** numbers of the sequence, 3, 4, 5, ... [2]

(b) the fourth number in the sequence. 1, 8, 27, ..., 125, 216 [1]

4. [JSC P2 2015 Q2]

(a) The table shows a pattern of numbers. Fill in the empty boxes. [2]

position	1	2	3	4	5
number	4	7		13	

(b) The diagram shows a pattern. Draw diagram 4 to continue the pattern. [2]

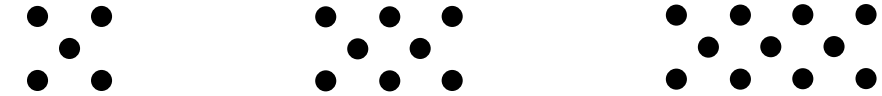


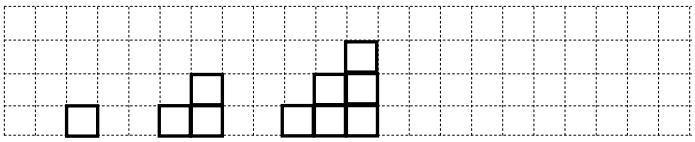
diagram 1 diagram 2 diagram 3

5. [JSC P1 2016 Q4]

Write down the next term in the given sequence: 1, 4, 9, 16, 25, 36, ... [1]

6. [JSC P2 2016 Q1]

Study the diagrams



step 1 step 2 step 3 step 4

(a) Draw the next diagram for step 4. [1]

(b) **Complete** the table about the number of squares of the diagrams.

Steps	1	2	3	4
Number of squares	1	3		

[2]

Section 3 Roots; powers; factors and multiples

1. [JSC P1 2013 Q4]

Find the Highest Common Factor (HCF) of 15 and 30 [1]

2. [JSC P2 2013 Q2]

Fill in the spaces in the grid by answering the questions below.

Write only one digit in each un-shaded space.

Question **(a) (iv)** (Across) has been done for you.

(i)		**(ii)**	
		(iii)	
	(iv)		
	(v) 1	5	

(a) Across **(from left to right)**

(i) Convert 0,254 kilograms to grams. [1]

(ii) Work out $10.5 \times 7 + 17.5$. [1]

(iii) A multiple of 9 between 90 and 100. [1]

(v) A factor of 30 and 75. [1]

(b) Down **(from top to bottom)**

(i) The cube root of 15 625 [1]

(ii) A square number between 40 and 50. [1]

(iv) The lowest common multiple of 3 and 7. [1]

3. [JSC P2 2014 Q2]

1 6 8 10 23 25 27 34 42

From the list of numbers above choose

(a) a factor of 32, [1]

(b) a multiple of 7, [1]

(c) a prime number, [1]

(d) a square number, [1]

(e) a power of 3. [1]

4. [JSC P2 2015 Q1]

(a) The list of numbers shows the factors of 24: 1 2 3 4 6 8 12 24

Use the list to **(i)** write down **two** prime factors of 24. [2]

(ii) write down **common** factors of 24 and 30 [2]

(iii) write down the highest common factor of 24 and 30. [1]

(b) Find the lowest common multiple (LCM) of 24 and 30. [1]

5. [JSC P1 2015 Q4]

From the list of numbers 23 56 76 113, write down a multiple of 7. [1]

6. [JSC P1 2015 Q5]

Write 36 as a product of prime factors. [1]

7. [JSC P1 2016 Q6]

Find the lowest common multiple (LCM) of 8 and 7. [1]

8. [JSC P2 2016 Q2]

(a) Express 216 as a product of its prime factors [2]

(b) Determine the cube root of 216. [1]

9. [JSC P2 2016 Q3]

30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 from the list of numbers, write down a

(a) a multiple of 4, [1]

(b) a factor of 70, [1]

(c) a prime number [1]

(d) a square number. [1]

Section 4 Ordinary fractions and percentages.

1. [JSC P1 2013 Q5]

On a Monday morning, a farmer realises that, $\frac{3}{5}$ of his goats slept in the kraal .

Calculate the percentage of the farmer's goats that slept outside the kraal. [2]

2. [JSC P1 2013 Q6]

Fill in the missing number in the following statement. $\frac{99}{132} = \frac{33}{.....}$ [1]

3. [JSC P2 2013 Q5]

A survey on the cause of heart diseases was conducted on A group of 16 500 Africans. The table shows the results.

causes	Fraction of people
high blood pressure	$\frac{1}{5}$
high cholesterol level	$\frac{7}{10}$
regular smoker	$\frac{1}{4}$
No physical exercises	$\frac{1}{5}$

(a) Write 16 500 in standard form. [2]

(b) Calculate the percentage of the group that has high blood pressure.

(c) How many people in the group have high cholesterol level? [2]

(d) Write the number of people who take no physical exercises to the number of people who are regular smokers. Give your answer in its simplest form. [2]

4. [JSC P1 2012 Q7]

Write down the following as fractions in their simplest form.

(a) 0.56 [1]

(b) 28% [1]

5. [JSC P2 2015 Q 5]

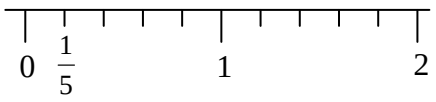
The number of children of Vanola was 360 000 in 2011 and 470 000 in 2013.

(a) Find the increase in the number of children from 2011 to 2013. [1]

(b) Calculate the percentage increase of the number of children from 2011 to 2013. [2]

6. [JSC P1 2015 Q 3]

On the number line, fill in the number $\frac{4}{5}$ to indicate its position. [1]



7. [JSC P1 2015 Q 7]

Write the number 0.45 as a common fraction in its simplest form. [1]

8. [JSC P1 2015 Q 8]

Work out $21 \div \frac{3}{13}$ [1]

9. [JSC P1 2015 Q 9]

In a class of 40 learners, 23 learners can swim. Calculate the percentage of learners that **cannot** swim.[2]

10. [JSC P1 2016 Q 2]

(a) Write 0.17 as a fraction. [1]

(b) Write $\frac{1}{4}$ as a percentage. [1]

11. [JSC P1 2016 Q12]

Gariseb earns N$1 100 pocket money every month. He spends 40% of his pocket money on transport every month. Calculate the amount of money he spends on transport every month. [2]

12. [JSC P2 2016 Q5]

John's mass is 88 kg. He went on holiday to Swakopmund for two weeks. After the holiday, his mass Had increased by 7.5%. Calculate the mass John gained during the holiday. [2]

13. [JSC P2 2016 Q6]

A bookshop sold a total of 3 850 books in may.

(a) If 28% of the books sold were motivational books, calculate the number of motivational books sold. [2]

(b) 140 spiritual books were sold. Write 140 as a common fraction of 3 850 in its lowest term. [2]

(c) In June , the bookshop sold 14% more than the 3 850 sold in May. Calculate the number of books sold in June. [3]

Section 5 Finances; loss; profit.

1. [JSC P1 2013 Q7]

Loide receives N$1 100 pocket money every month. She spends 54% of her pocket money on transport. Calculate the amount she spends on transport per month. [2]

2. [JSC P1 2013 Q10]
Selma bought a second hand chair for N$50.00. She later sold it for N$75.00.
Calculate the percentage profit Selma made. [2]

3. [JSC P2 2013 Q6]
4 metres of a dress material costs N$124.40. How much does 1 metre cost? [2]

4. [JSC P2 2012 Q2]
Building work will take one man 160 hours to complete.
(a) How long will it take 4 men? [2]
(b) Each man is paid N$3,50 per hour. How much will each of the 4 men get? [2]

5. [JSC P2 2012 Q4]
(a) Mr. Uirab buys 9 DVD players for N$425.00 each. Calculate the cost for 9 DVD players. [2]
(b) Mr. Uirab sells the DVD players in his shop for N$595.00 each. Calculate the percentage profit he makes on each one. [3]
(c) A television set in Mr. Uirab shop costs N$442.00. Mr. John buys a television set and a DVD player from Mr. Uirab's shop. He is given a discount of 15% on the total price.
Calculate how much Mr. John pays. [3]

6. [JSC P2 2015 Q 6]
Josh bought items from a shop and received the cash slip shown in the table. Use the cash slip to answer the questions that follow.

CASH SLIP		
items	**quantity**	**amount**
Pencils	4	N$2.20
Exercise books	3	**(b)**
Pens	2	N$4.70
Subtotal		N$16
Tax		N2.43

(a) Calculate the price of 1 pencil. [1]
(b) One exercise book N$3.10. Determine the cost of 3 exercise books. [1]
(c) Express the tax as a percentage of the subtotal. [2]

7. [JSC P1 2015 Q 13]
Joan buys a bread toaster for N$259.95 and later decided to sell it for N$189.95.
(a) Find the loss she made. [1]
(b) Calculate her percentage loss. [2]

8. [JSC P1 2016 Q 11]
Selma bought a second hand car for N$50 000. She later sold the car for N$75 000.
(a) Calculate the profit Selma made on the car. [1]
(b) Calculate the percentage profit Selma made on the car. [2]

Section 6 Ratio and proportion

1. [JSC P1 2013 Q8]
(a) During an athletics event, a snack bar sold 84 cola cans and 54 lemonade cans on the first day. Write down the ratio of cola cans to lemonade cans sols the first day. Give your answer in its simplest form. [1]
(b) On the second day, the snack bar sold 28 cola cans. The ratio of the types of cans sold was as Follows cola cans : lemonade cans 4 : 5. How many lemonade cans were sold? [2]

2. [JSC P2 2013 Q4]

The people of country **G** were asked to vote for Red Party or Blue Party or Green Party in an election. The votes were shared between the Red, Blue and Green parties in the ratio 5 : 8 : 7 respectively.

(a) What fraction of the votes did the Red party receive? Give your answer in its simplest form. [2]

(b) The total number of votes was 12 600 000. How many votes did the Green party receive? [2]

3. [JSC P2 2014 Q5]

Peter has 25 litres of paint. He uses 2.5 litres per hour to paint the house.
He finishes painting the house in 5.5 hours.

(a) How many litres of paint did he use to paint the house? [2]

(b) Calculate the **(i)** amount of paint left, [1]

(ii) percentage of the paint used. [2]

4. [JSC P2 2014 Q6]

To make mild steel, Comby's steel factory mixes 1 176 g of iron and 24 g of carbon.

(a) Write down

(i) the ratio of the amount of iron to the amount of carbon used in its simplest form. [2]

(ii) the amount of carbon as a fraction of the amount of the mixture. [1]

(iii) the amount of iron as a percentage of the total mixture. [2]

(b) Calculate the amount of iron in 400 g of mild steel. [2]

5. [JSC P2 2015 Q4]

A mother gives N$4 200 to her sons, in the ration of their age.
Peter receives N$1 800, Robert receives N$2 700.

(a) (i) Write down the ratio of money received by Peter to the money received by Robert in its simplest form. [2]

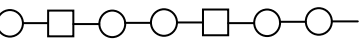
(ii) Robert is 15 years old. Calculate Peter's age. [2]

(b) Peter spends 40% of his money. How much did Peter spend? [2]

(c) (i) Robert still has $\frac{7}{10}$ of his money. Calculate the amount of money Robert still has. [2]

(ii) Write the amount of money spend by Robert as a percentage of the total he received from his mother. [2]

6. [JSC P1 2015 Q10]

The diagram shows a necklace made of round and square beads: 

Write down the ratio of square beads to round beads in its simplest form. [1]

7. [JSC P1 2015 Q11]

The ratio of girls to boys in a class is 4 : 3. There are 28 learners in the class. Find the number of girls in the class. [2]

8. [JSC P1 2016 9]

Two men can build a wall in three days.
How long will it take six men to build the same wall if they work at the same rate? [2]

9. [JSC P1 2016 10]

At a certain private school the ratio of teachers to learners is 1 : 25. There are 33 teachers at the school. Calculate the number of learners at the private school. [1]

10. [JSC P2 2016 Q7]

A car consumes 0.05 ℓ of fuel per kilometre.

(a) The car travelled 105 km. How much fuel did the car use? [2]

(b) Fuel costs N$9.98 per litre. Calculate how much it will cost to travel a distance of 105 km. [2]

Section 7 Average speed; covered distance and distance time graphs.

1. [JSC P1 2013 Q9]

Mr. Goaseb travelled 200 km in 2.5 hours. Calculate his average speed. [2]

2. [JSC P2 2014 Q14]

Fiona cycles from home to the grocery shop.

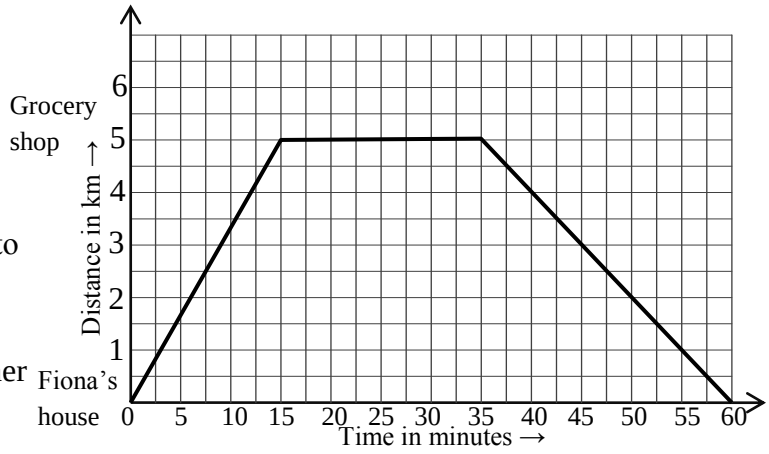
The graph shows her journey.

(a) Determine

(i) The distance from Fiona's house to to the shop. [1]

(ii) the time Fiona spent at the shop. [1]

(b) Calculate her average speed during her journey to the shop in km/minute. [2]



3. [JSC P1 2012 Q12]

Frankie runs 100 metres in 25 seconds. Calculate his average speed in metres per second. [2]

4. [JSC P1 2016 Q5]

A car travelled at a speed of 120 km/h for 4 hours. Calculate the distance travelled by the car. [2]

Section 8 Exchange rate and other rates including income tax

1. [JSC P1 2013 Q11]

Mr. Witbooi exchanged N$2 400 to US dollars. The exchange rate was, $1.00 = N$10.24.

Determine the amount of money he got in US dollars. [2]

2. [JSC P2 2013 Q8]

Shop **A** sells rice at N2,56 per 500 grams. The same rice is sold by shop **B** at N$12.20 per 2.5 kg.

(a) Work out the price per kilogram for **(i)** shop **A** [2]

(ii) shop **B** [1]

(b) Which shop **A** or **B** sells the rice at a cheaper price? [1]

3. [JSC P2 2015 Q8]

The table shows a section of the Namibian Tax Rate table.

Taxable Amount	Rates of tax
Exceeds N$40 000 but does not exceed N$80 000	27% of the amount by which the taxable amount exceeds N$40 000.

Use the table to answer the questions.

Mr.Witbooi earns N$57 780 and contributes a tax free amount of N$ 3 780 to a retirement fund per year.

Calculate

(a) his taxable income. [1]

(b) the amount of income tax Mr. Witbooi pays. [3]

4. [JSC P1 2015 Q7]

Sikopo takes 7 minutes to read 5 pages of a book. How long will he take to read 10 pages?

He reads at the same rate. [2]

5. [JSC P1 2015 Q14]

Given that N$1 = €0.07. Convert N$420 to euros (€) [2]

6. [JSC P1 2016 Q8]

Ms Van Zyl's water bill for February was N$511.50 and the amount of water used was 33 m^3.
Calculate the cost of water per m^3. [1]

7. [JSC P1 2016 Q13]

Werner wants to change N$2 400 to British pounds (£). If the exchange rate is £1.00 = N$18.00, calculate the amount of money he got in British pounds (£). [2]

8. [JSC P2 2016 Q8]

Study the income tax table below and answer the questions that follows.

INDIVIDUAL INCOME TAX TABLE All individuals (inc. deceased estates and trusts) other than companies.		
Tax bracket	**Taxable income N$**	**Rates of tax for the year to be assessed.**
A	0 – 50 000	0%
B	50 001 – 100 000	18% for each amount above 50 001
C	100 001 – 300 000	9000 + 25% for each amount exceeding 100 001
D	300 001 – 500 000	59 000 + 28% for each amount exceeding 300 001
E	500 001 – 800 000	115 000 + 30% for each amount exceeding 500 001
F	800 001 – 1 500 000	205 000 + 32% for each amount exceeding 800 001
G	Above 1 500 001	429 000 + for each amount exceeding 1 500 001

Mr. Sinvula earns N$21 679.00 per month.

(a) Calculate his gross salary per year. [1]

(b) Mr. Sinvula's allowable deductions are N$1 200 study policy and N$13 308 to pension fund per year.

(i) Calculate his taxable income. [2]

(ii) In which tax bracket does his taxable income fall? [1]

(iii) Calculate the total tax Mr. Sinvula would pay per year. [3]

Section 9 Conversions of units & lengths

1. [JSC P1 2013 Q12]

A farmer has 20 hectares of land. Express 20 hectares in square meters (m^2) [1]

2. [JSC P1 2012 Q4]

A farmer has 20 hectares of land. Express this area in m^2. (1 ha = 10 000 m^2) [2]

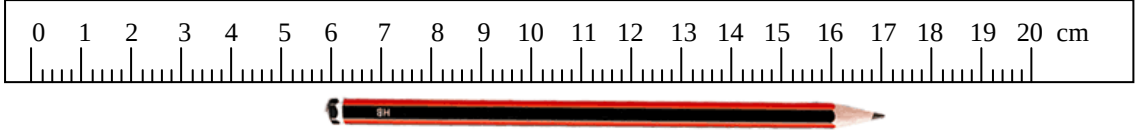
3. [JSC P2 2015 Q9]

(a) Convert $\frac{3}{4}$ litres to ml. [1]

(b) Convert 540 000 m^2 to hectares. [1]

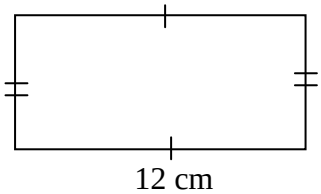
4. [JSC P1 2015 Q21]

The diagram shows a pencil, measured with a ruler. Write down the length of the pencil. [1]



5. [JSC P1 2016 Q15]

The rectangle has a length of 12 cm and a breadth of 8 cm.
Calculate the perimeter of the rectangle. [2]



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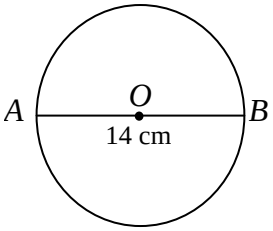
6. [JSC P1 2016 Q17]
The volume of a bottle is 1 250 cm^3. Convert the volume of the bottle in litres (ℓ). [1]

7. [JSC P2 2016 Q 11]
Convert **(a)** 525 ha into m^2 **(b)** 2ℓ into mℓ **(c)** 7500 cm^3 into litres (ℓ) each [1]

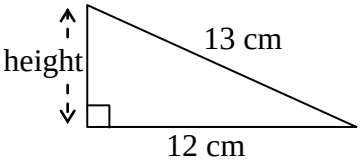
Section 10 Circles and other area calculations

1. [JSC P1 2013 Q13]
The diagram shows a circle of centre *O*, with line *AB* = 14 cm.

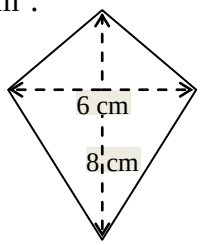


(a) State the special name for line *AB*. [1]
(b) Calculate the circumference of the circle. ($\pi = \frac{22}{7}$) [2]

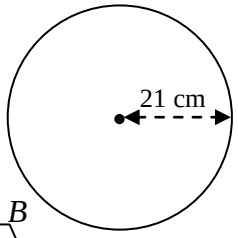
2. [JSC P1 2013 Q14]
The diagram shows a right angled triangle.
The area of the triangle is 30 cm^2.
Calculate its height. [2]



3. [JSC P1 2015 Q16]
Calculate the area of the kite. [2]



4. [JSC P1 2016 Q16]
Calculate the area of the circle with a radius of 21 cm. (Use $\pi = \frac{22}{7}$) [2]



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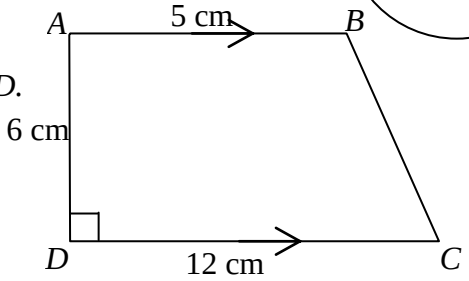
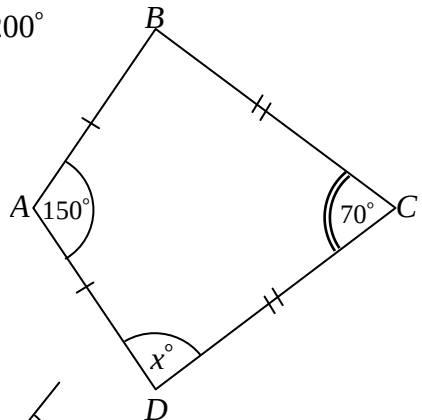
5. [JSC P2 2016 Q15]
(a) Give a geometrical name of shape *ABCD*. [1]
(b) Calculate the area of shape *ABCD*. [2]



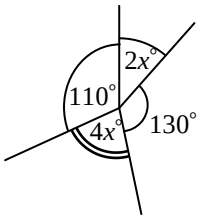
Section 11 Angle calculations and bearings.

1. [JSC P1 2013 Q15]
The list of different types of angles is given: **reflex, right, acute** and **obtuse.**
Use the list to name the angle with the following values: **(a)** 120° [1]
(b) 200° [1]

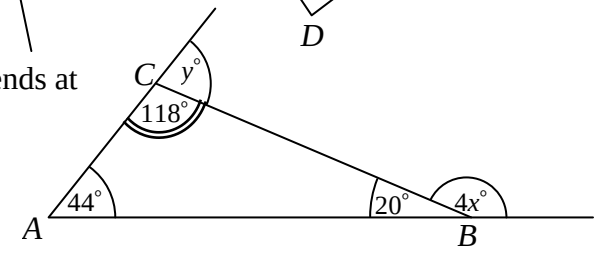
2. [JSC P2 2013 Q11]
In the diagram to the right *AB=DA* and *BC=CD*.
(a) What is the name of quadrilateral *ABCD*? [1]
(b) Calculate the value of angle *x*. [2]



3. [JSC P2 2013 Q12]
(a) Calculate the angle *x* in the diagram. [2]

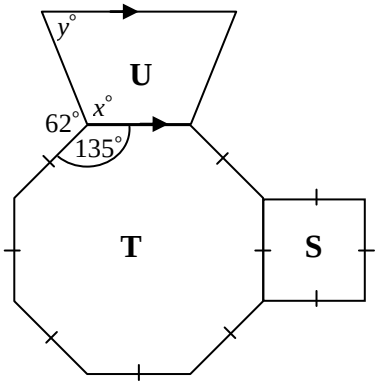


(b) The diagram show triangle *ABC*. Line *AB* extends at point *B* and line *AC* extends at point *C*.
Calculate **(i)** the value of *x*. [2]
(ii) the value of *y*. [1]



4. [JSC P2 2014 Q10]

The diagram shows three polygons **S, T** and **U.**



(a) Find **(i)** the size of the interior angle of polygon **S.** [1]

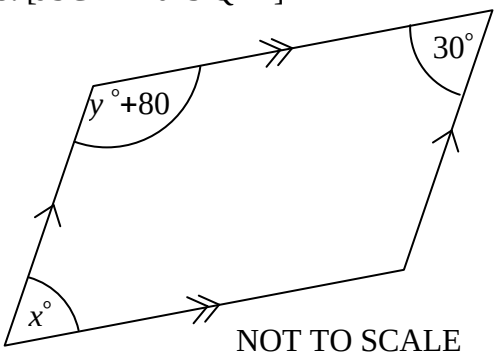
(ii) the sum of the interior angles of polygon **T.** [2]

(b) Calculate **(i)** the value of x, [2]

(ii) the value of y. [2]

(c) State the mathematical name of polygon **U.** [1]

5. [JSC P2 2015 Q 12]

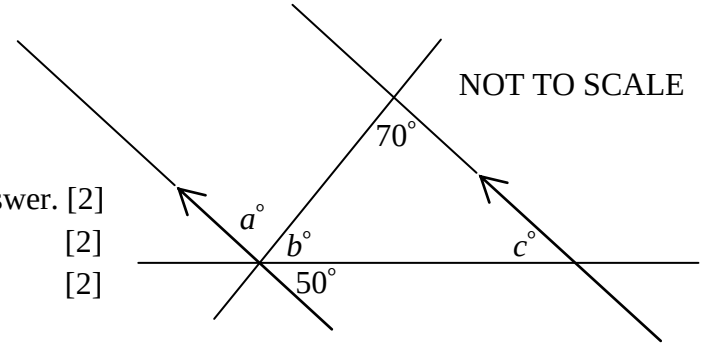


NOT TO SCALE

The diagram shows a parallelogram.

(a) (i) Find the value of x . [1]

(ii) Calculate the value of y. [2]



NOT TO SCALE

(b) Use the diagram to answer the questions.

(i) Find the value of a and state a reason for you answer. [2]

(ii) Calculate the value of b. [2]

(iii) Calculate the value of c. [2]

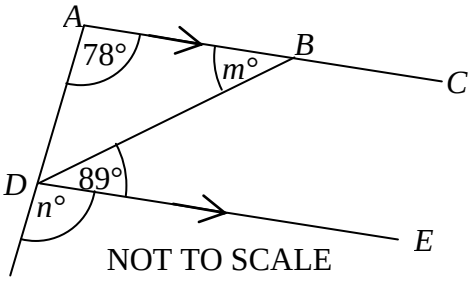
6. [JSC P1 2015 Q 20]

Calculate the sum of the interior angles of a regular polygon with 7 sides. [2]

7. [JSC P1 2016 Q 18]

In the diagram AC is parallel to DE.

Angle $BDE = 89°$ and angle $BAD = 78°$



NOT TO SCALE

(a) Find the size of $m°$ [1]

(b) Find the size of $n°$ [1]

8. [JSC P1 2016 Q 19]

The exterior angle of a regular polygon is 40°. Calculate the number of sides of the polygon. [2]

9. [JSC P2 2016 Q 13]

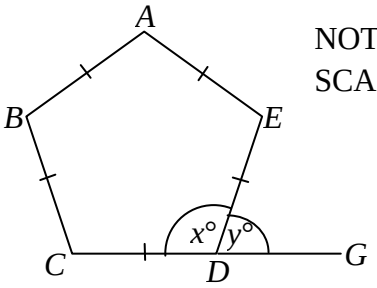
(a) The diagram shows a regular pentagon $ABCDE$.

Line CD is extended to G.

Calculate

(i) the size of interior angle of the pentagon ($x°$) [2]

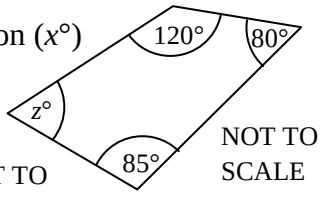
(ii) the size of angle $y°$ [1]



NOT TO SCALE

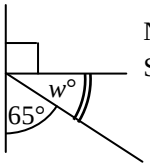
(b) The diagram shows a quadrilateral

Calculate the value of $z°$. [2]



NOT TO SCALE

(c) Calculate the value of $w°$. [2]



NOT TO SCALE

Section 12 Symmetry

1. [JSC P1 2013 Q16]

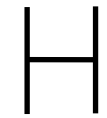


diagram 1

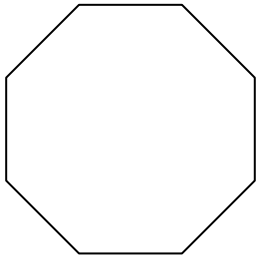
diagram 2

(a) What is the order of rotational symmetry of the shape in diagram 1? [1]

(b) Draw the line of symmetry in diagram 2. [1]

2. [JSC P2 2012 Q7]

The diagram show a regular octagon.



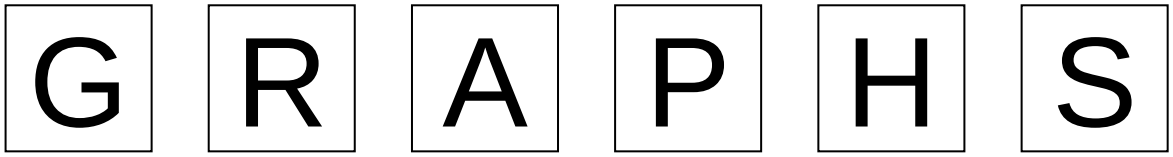
(a) How many lines of symmetry are there in a octagon. [1]

(b) Calculate the sum of the interior angles in a regular octagon. [2]

(c) Calculate the value of one interior angle in a regular octagon. [1]

(d) Calculate the value of one exterior angle in a regular octagon. [2]

3. [JSC P2 2015 Q11]



(a) From the word above, write down the letter that has

(i) two lines of symmetry [1]

(ii) no line of symmetry but has rotational symmetry of order 2. [1]

(b) Draw the line(s) of symmetry on letter A. [1]

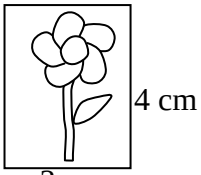
Section 13 Transformations

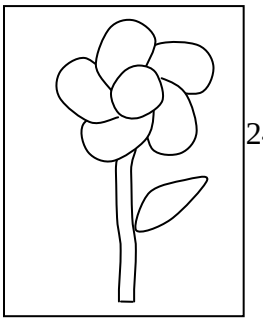
1. [JSC P1 2013 Q17]

A photograph measuring 4 cm long and 3 cm wide is enlarged.

The length of the enlarged photograph is 24 cm as Shown in the diagram.

NOT TO SCALE



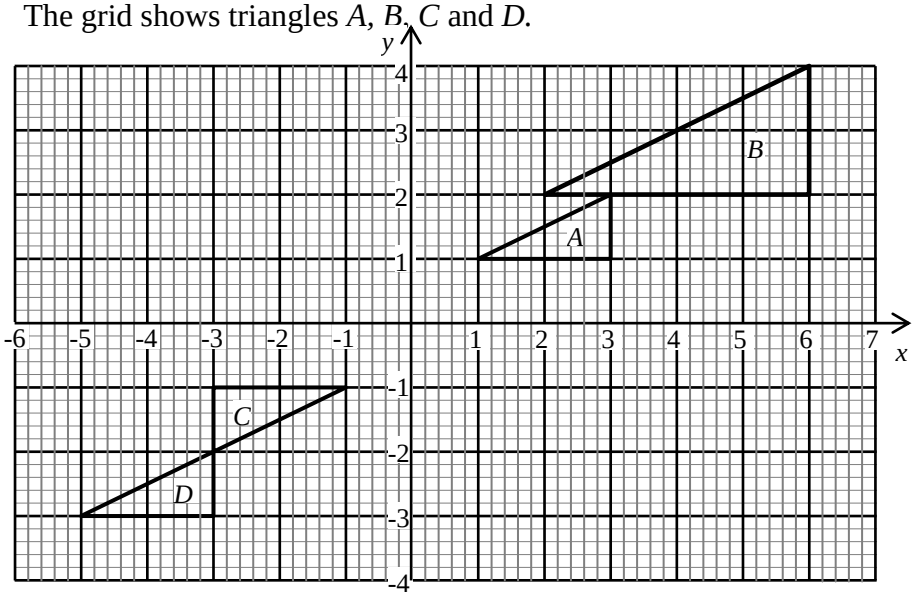


(a) What is the width of the enlarged photograph? [1]

(b) Write down the scale factor of the enlargement. [1]

2. [JSC P2 2013 Q13]

The grid shows triangles *A*, *B*, *C* and *D*.



(a) *B* is an enlargement of *A*. Give the centre of enlargement and the scale factor. [2]

(b) Describe fully a single transformation which maps triangle *C* onto triangle *D*. [2]

(c) Reflect triangle *A* in the *y*-axis and label it *E*. [2]

3. [JSC P2 2014 Q11]

Triangles **A, C** and **D** are drawn on the grid to the right.

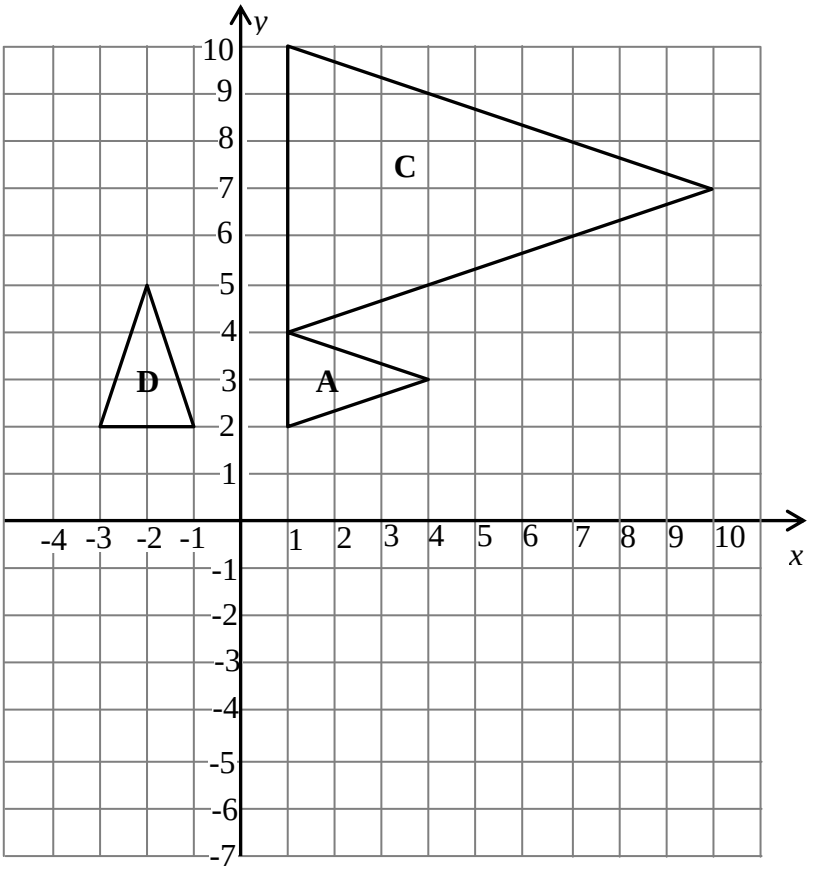
(a) On the grid, draw the reflection of triangle **A** in the *x*-axis and label it **B.** [2]

(b) Triangle **C** is an enlargement of triangle **A.**

(i) Find the scale factor of the enlargement. [2]

(ii) Write down the coordinates of the centre of the enlargement. [2]

(c) Describe fully the single transformation that maps, triangle **A** onto triangle **D.** [3]



4. [JSC P2 2015 Q10]

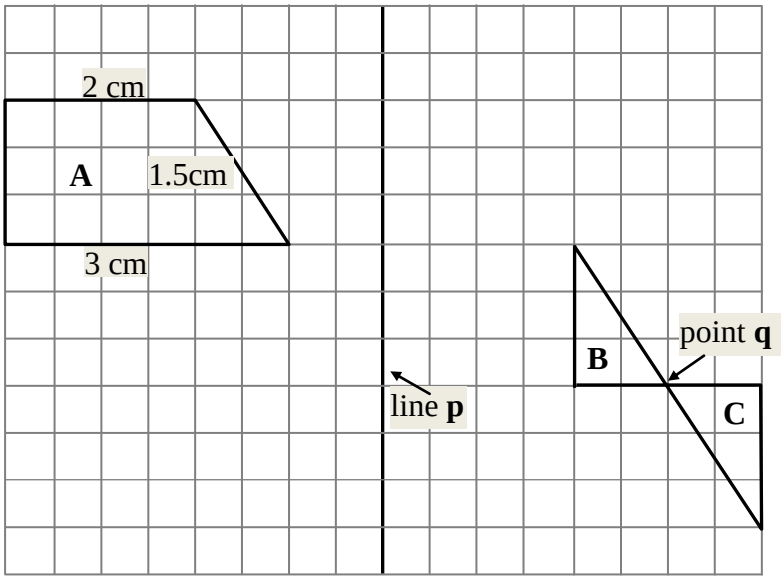
The diagram shows shapes **A, B** and **C** drawn on a grid. The two sides of shape **A** are 2 cm and 3 cm long and its height is 1.5 cm.

(a) (i) Give the geometrical name for shape **A.** [1]

(ii) Calculate the area of shape **A.** [2]

(iii) Reflect shape **A** through line **p.** [2]

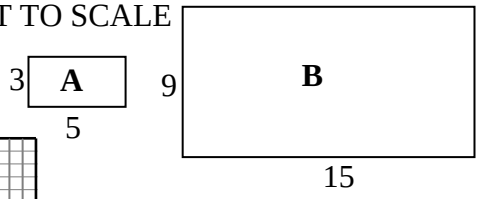
(b) Describe fully the transformation that maps shape **B** onto **C.** [3]



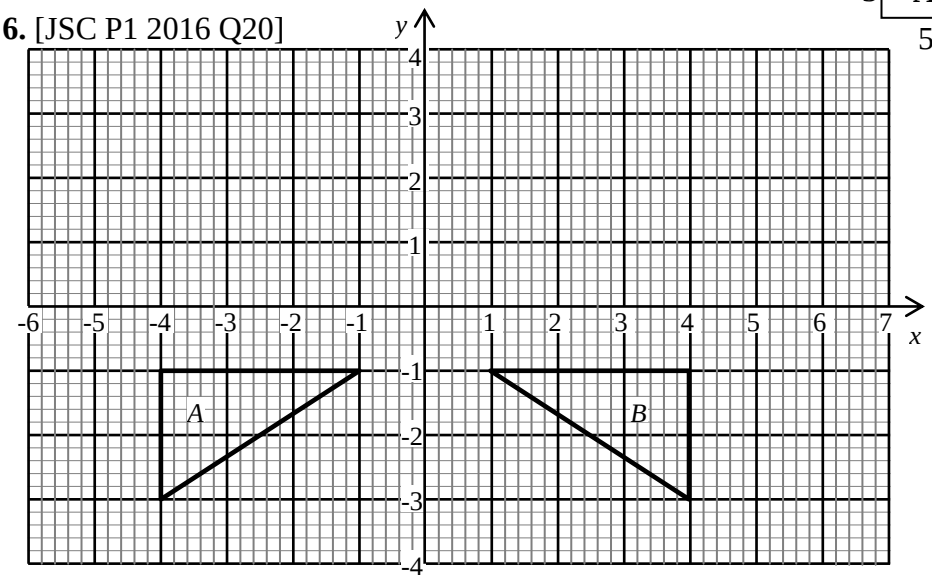
5. [JSC P1 2015 Q19]

Object **A** is enlarged to image **B**. What is the scale factor? [1]

NOT TO SCALE

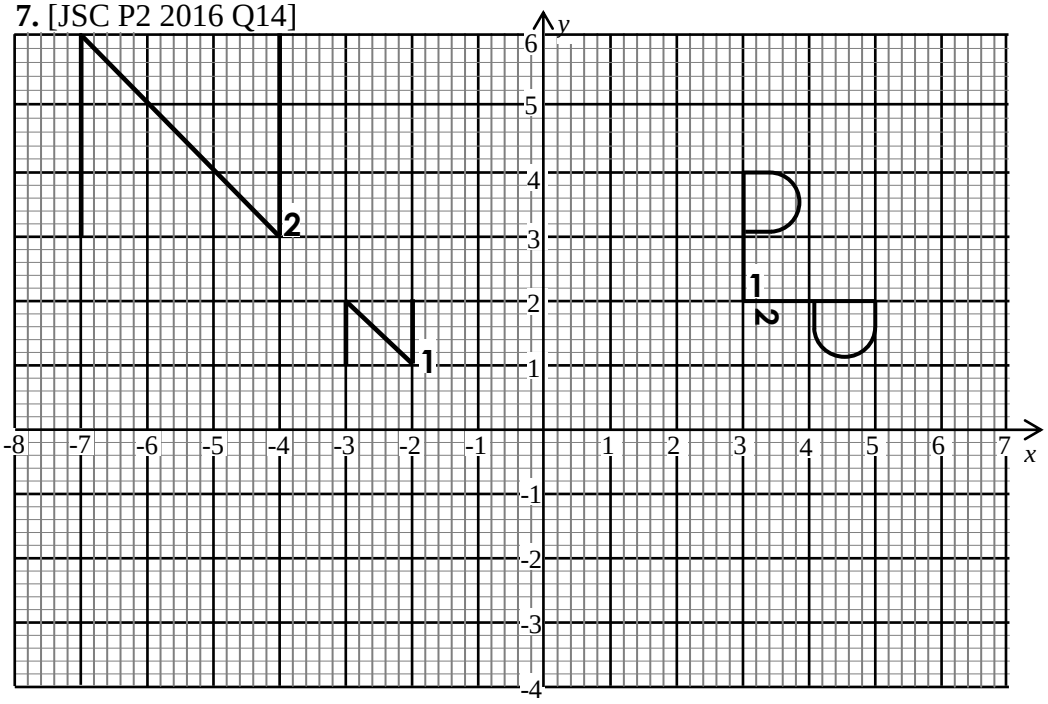


6. [JSC P1 2016 Q20]



The grid shows triangle *A* and triangle *B*.
Describe fully a single transformation which maps triangle *A* onto triangle *B*. [2]

7. [JSC P2 2016 Q14]



(a) P_1 is a rotation of P_2. Write down the co-ordinates of the centre of rotation. [1]

(b) Describe fully a single transformation which maps N_1 onto N_2. [3]

Section 14 Algebra

1. [JSC P1 2013 Q18]

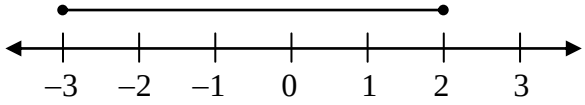
(a) Simplify **(i)** $t^2 \times t^6$ [1]

(ii) $4(3x + 2)$ [1]

(b) Solve the equation $3(2x - 1) = 3$ [2]

2. [JSC P2 2013 Q14]

A set of numbers is represented on a number line.



(a) Write down the inequality represented on the number line. [2]

(b) What is the smallest integer in the set represented by the number line? [1]

3. [JSC P2 2013 Q15]

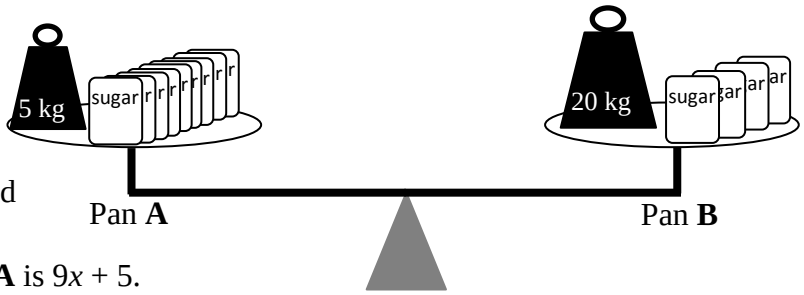
The diagram shows packets of sugar on the pans of a weighing balance.

Each packet of sugar has a mass of x kg.

In pan **A**, there are 9 packets of sugar and a metal load of mass 5 kg.

An expression for the total mass in pan **A** is $9x + 5$.

In pan **B,** there are 4 packets of sugar and a metal load of mass 20 kg.



(a) Write down in terms of x an expression for the total mass of Pan **B.** [1]

(b) The total mass of pan **A** is equal to the total mass in pan **B**. Write down an equation in term of x to represent this information. [1]

(c) Use your equation in part **(b)** to calculate the mass x kg, of one packet of sugar. [3]

4. [JSC P2 2007 Q10]

(a) Simplify the expression $3x^2 + 5xy + 4x^2 - 9xy$ [2]

(b) Remove the brackets and simplify the expression $9a(2a^2 - 3ab - 1)$. [3]

5. [JSC P2 2014 Q12]

(a) Given that $y = 4x^3 + 12x$. Find the value of y when $x = 2$. [2]

(b) Multiply out $2(2x - y)$ [2]

6. [JSC P2 2014 Q13]

Tom is x years old. His father is 25 years older than him.

(a) Write down an expression of his father's age in terms of x. [1]

(b) (i) The sum of their ages is 51years. Write down an equation in terms of x. [1]

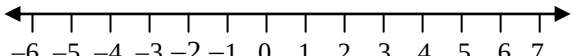
(ii) Calculate Tom's age, by finding the value of x in the equation in part **(b) (i).** [2]

7. [JSC P1 2012 Q11]

(a) Factorise completely $3x - 9xy$ [2]

(b) Solve the following equation $3y - 7 = y + 4$ [2]

8. [JSC P2 2015 Q13]



(a) Use the number line to show the inequality $-2 < x \leq 3$. [2]

(b) Solve for m, $4(4m - 1) - 9m = 17$ [3]

(c) Simplify **(i)** $(2x^3)^0$ [1]

(ii) $(2x^3)^2$ [2]

9. [JSC P1 2015 Q22]

Given that $x = -2$, find the value of x^2. [1]

10. [JSC P1 2015 Q23]

When number x is multiplied by 3 the answer is 15.

(a) Write the above statement as an equation [1]

(b) Calculate the value of x. [1]

11. [JSC P1 2015 Q24]

Simplify $3y + 4x + 2y - 6x$ [2]

12. [JSC P1 2016 Q21]

(a) Simplify $\dfrac{12a^3b^6c}{6a^2b}$ [2]

(b) Factorize completely $22x + 11xy$ [2]

13. [JSC P2 2016 Q16]

(a) Simplify $2x^2 \times 14y$ [1]

(b) Solve for x $2(3x - 1) = 4(x - 3)$ [3]

14. [JSC P2 2016 Q17]

Ntando is x years old. Diana is 6 years older than Ntando.

(a) Write the age of Diana in terms of x. [1]

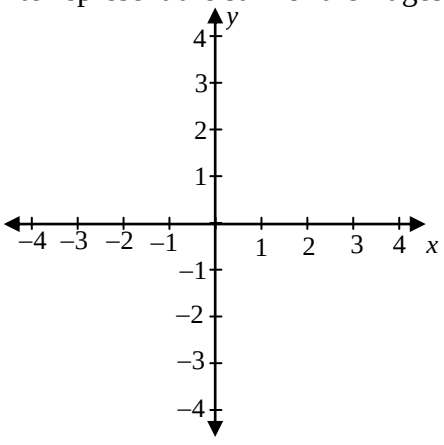
(b) The sum of their ages is 24. Write down the equation to represent the sum of their ages. [1]

(c) Solve the equation in part **(b)** to find Ntando's age. [2]

Section 15 Coordinate geometry & graphs of functions

1. [JSC P1 2013 Q19]

On the grid to the right

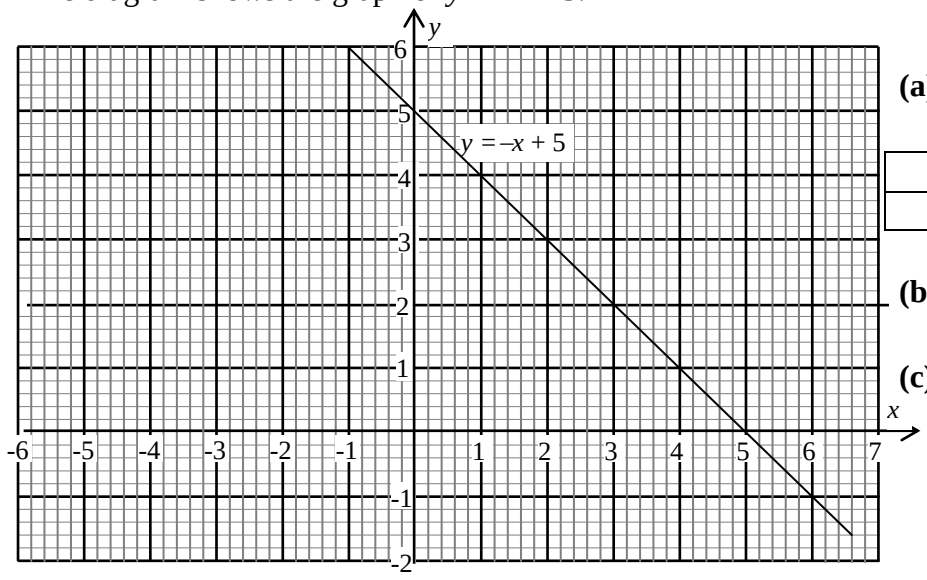


(a) Draw the line of $y = -3$ [1]

(b) Plot the point (2, 0) and label it *A.* [1]

2. [JSC P2 2013 Q16]

The diagram shows the graph of $y = -x + 5$.



(a) Complete the table of values for the equation $y = x + 1$.

x	–2	0	2	**(ii)**
y	**(i)**	1	3	5

[2]

(b) Draw the graph of $y = x + 1$ on the grid to the left. [2]

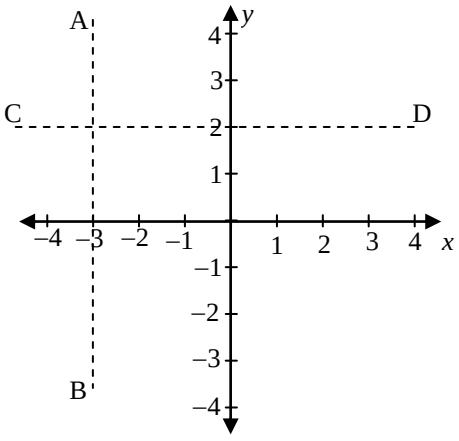
(c) Write down the coordinates of the point where the two graphs intersect. [2]

3. [JSC P1 2012 Q15]

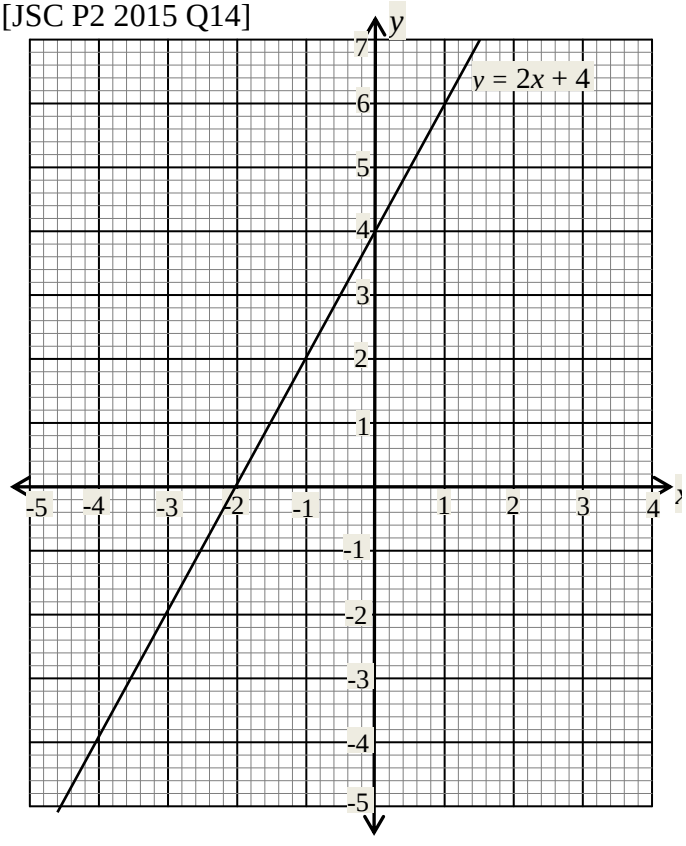
(a) Using the diagram to the right write down the equation of **(i)** AB [1]

(ii) CD [1]

(b) Write down the coordinates of the point of Intersection of line AB and CD. [2]



4. [JSC P2 2015 Q14]



(a) The graph of $y = 2x + 4$ is drawn on the grid. Write down the y-intercept of the line drawn. [1]

(b) Complete the table below for $y = -2x - 1$

x	–4	–3	–2	0	2
y	7	**(i)**	3	**(ii)**	–5

[2]

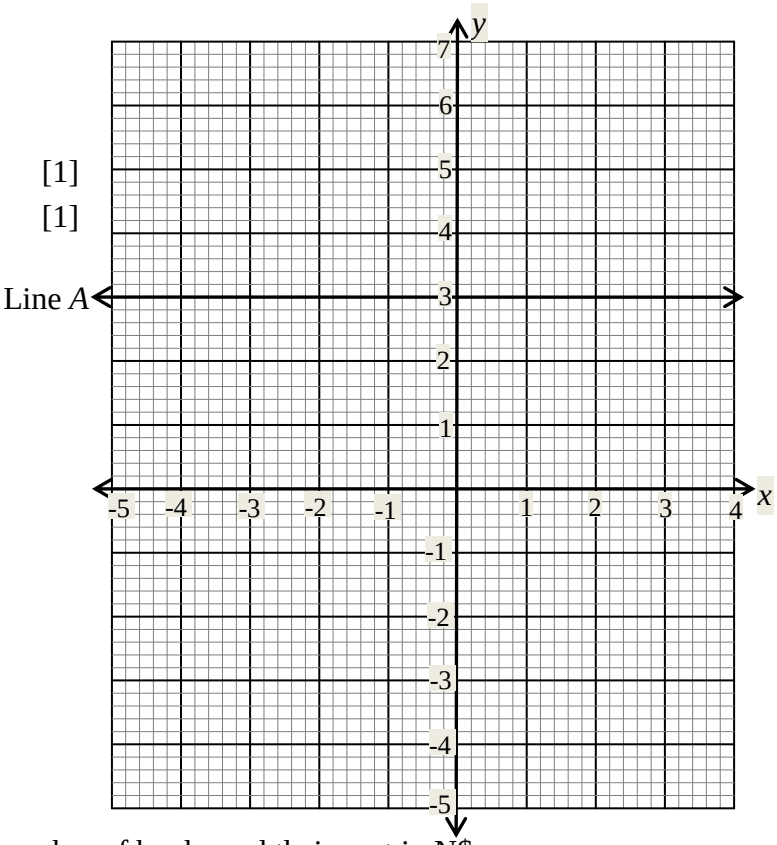
(c) On the grid, draw the graph of $y = -2x - 1$ [2]

5. [JSC P1 2015 Q25]

Line *A* is drawn on the graph.

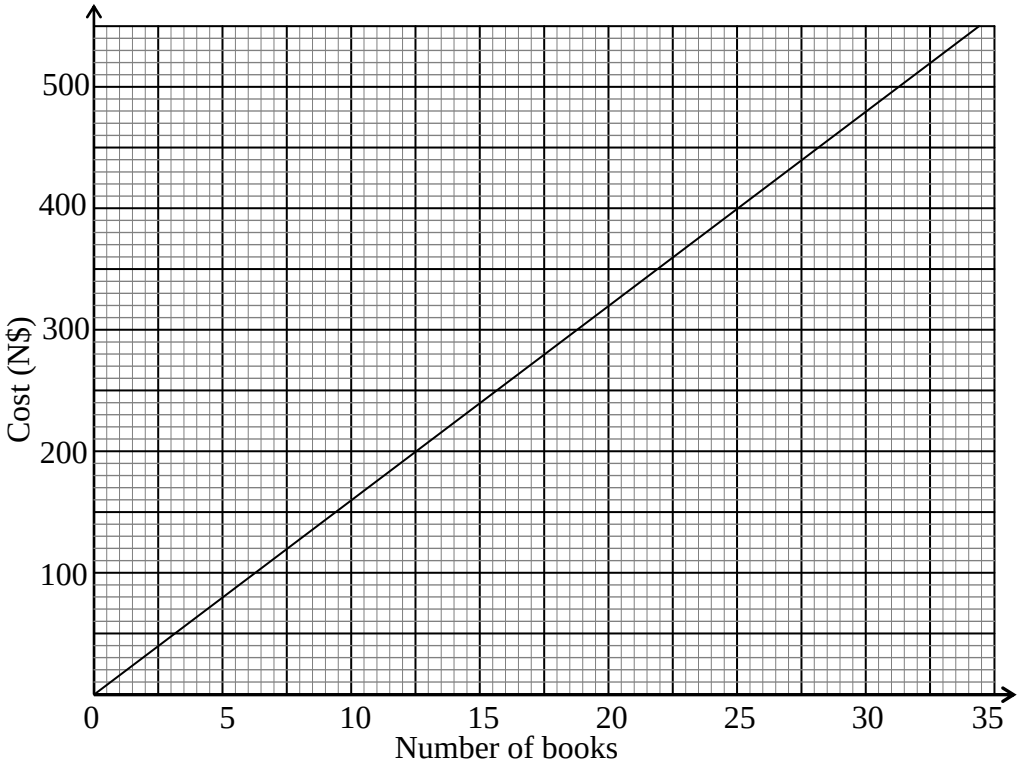
(a) Write down the equation of line *A*. [1]

(b) Plot the point (–3 ; 4) and label it *B*. [1]



6. [JSC P1 2016 Q22]

The graph shows the relationship between the number of books and their cost in N$.



Use the graph to find

(a) the cost of 10 books. [1]

(b) the number of books that can be bought for N$450. [1]

7. [JSC P2 2016 Q18]

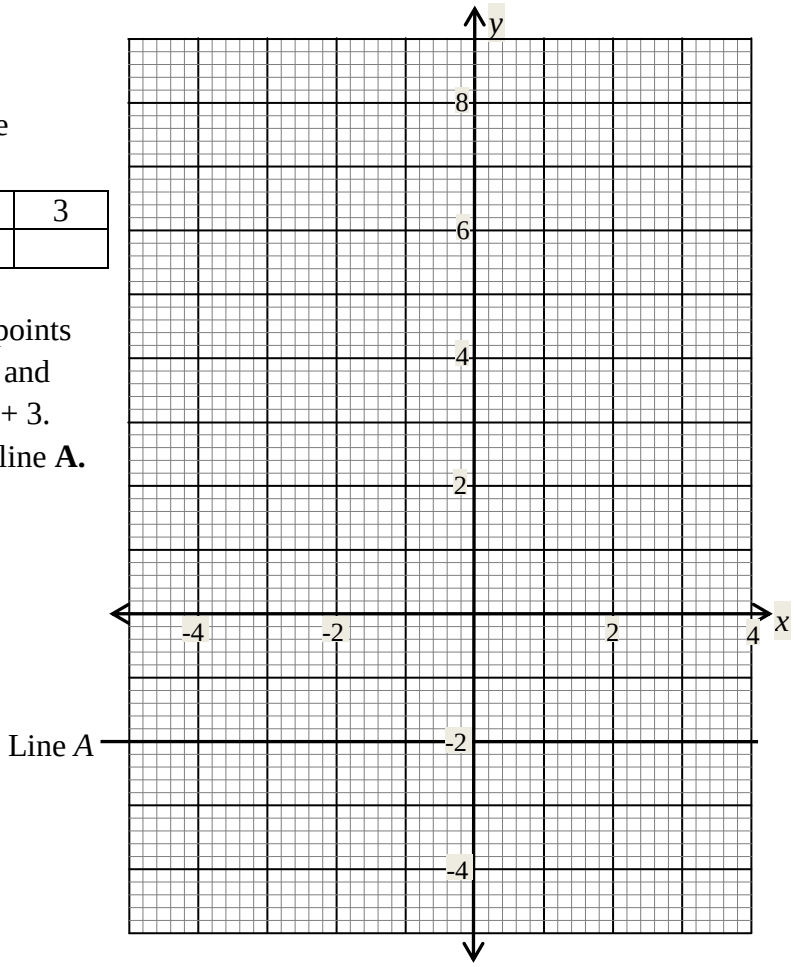
(a) (i) Complete the table for the equation $y = 2x + 3$.

x	−3	−2	0	2	3
y	−3		3	7	

[2]

(ii) On the grid, plot all the points in the table in part **(a) (i)** and draw the graph of $y = 2x + 3$. [2]

(b) Write down the equation of line **A.** [1]



Section 16 Statistics

1. [JSC P1 2013 Q20]

The ages of the people in a group are as follows: 63 32 34 64 32 27 35

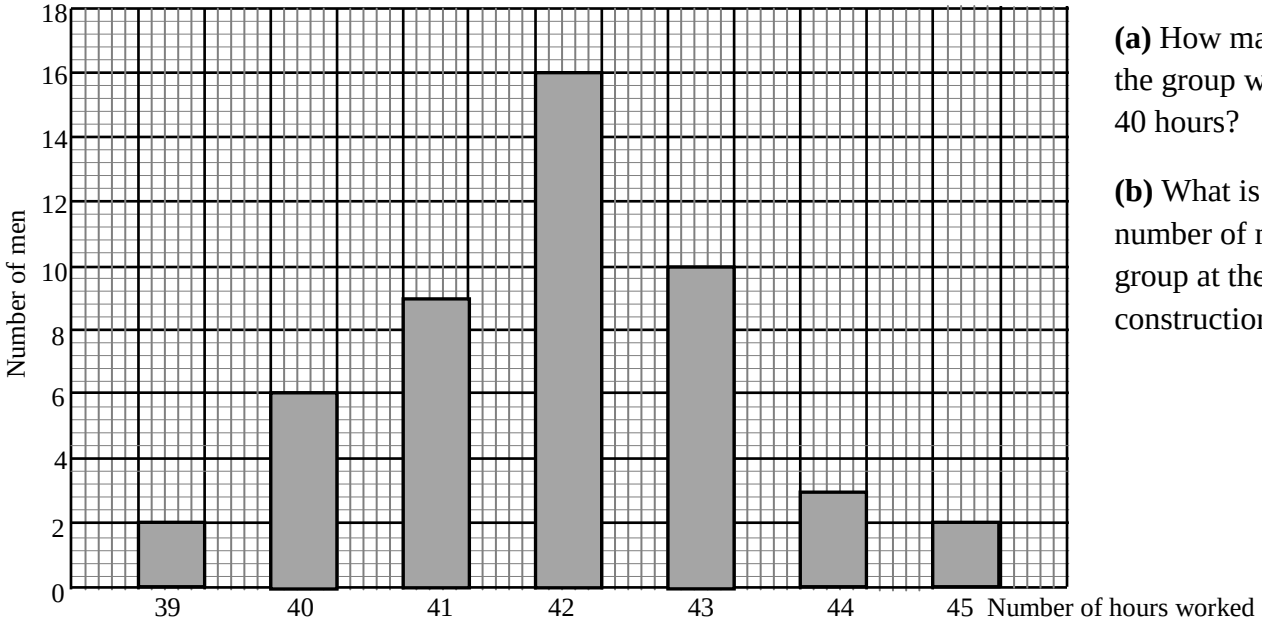
(a) Calculate the mean. [2]

(b) Determine the mode. [1]

(c) Find the median. [1]

2. [JSC P2 2013 Q18]

The bar chart shows the number of hours worked by a group of men at a construction site in one week.



(a) How many men in the group worked for 40 hours? [1]

(b) What is the total number of men in the group at the construction side? [2]

3. [JSC P2 2014 Q15]

The list shows the estimated height, in metres, of 15 boys in Grade 10.

1.4 1.6 1.3 1.6 1.5 1.4 1.2 1.3 1.6 1.3 1.6 1.4 1.5 1.6 1.5

(a) Complete the frequency table to the right. [1]

(b) Find the median height. [2]

(c) Calculate the mean. [2]

(d) One learner is picked at random. Write down the Probability that his estimated height is 1.4 m. Give your answer in its simplest form. [2]

Height (m)	frequency
1.2	1
1.3	
1.4	3
1.5	
1.6	5

4. [JSC P2 2015 Q15]

In a survey, 2 Grade 10 learners recorded the number of occupants in the cars stopping at a road block in one hour. The table shows their results.

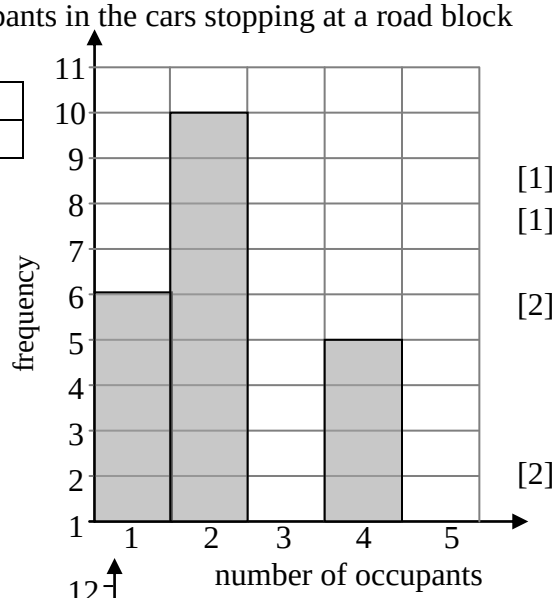
Number of occupants in the car	1	2	3	4	5
Number of cars (frequency)	6	10	8	7	3

(a) Determine the **(i)** mode [1]

(ii) median [1]

(b) Calculate the average number of occupants in the cars that passed at the road block that hour. [2]

(c) The results of the survey were used to draw a a histogram in the grid to the right. Complete the histogram to show the frequencies of the cars having 3 and 5 occupants. [2]

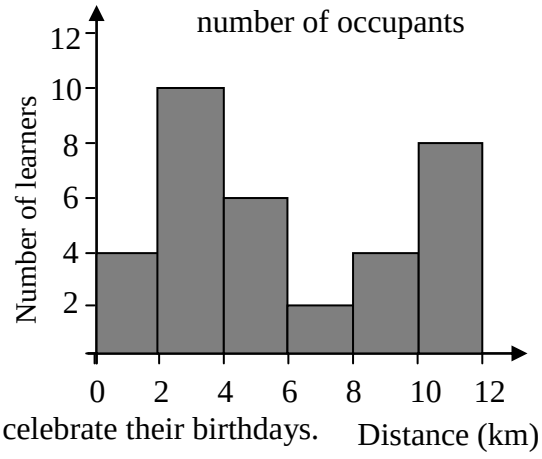


5. [JSC P1 2015 Q27]

The histogram shows the distance travelled by 34 learners to school everyday.

(a) Write down a modal class interval of the distance. [1]

(b) How many learners travelled between 6 km and 8 km? [1]



6. [JSC P1 2016 Q23]

Nelago asked each learner in her class the month in which they celebrate their birthdays. The results are shown in the table.

Month	**Number of birthdays**
January	3
February	8
March	2
April	3
May	1
June	3
July	1
August	3
September	5
October	3
November	2
December	2
Total	36

(a) In which month were most birthdays celebrated? [1]

(b) Write down the **number of months** where 3 birthdays were celebrated. [1]

(c) Calculate the average number of birthdays per month. [2]

7. [JSC P2 2016 Q19]

Fifteen Grade 10A learners wrote the English test. Their scores are recorded below.

18 10 8 10 3 16 16 10 2 16 9 4 11 16 12

(a) Using the scores given above, find

(i) the mode [1]

(ii) the median [2]

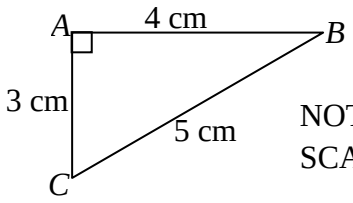
(iii) the range of the scores. [1]

(b) One of the learners is chosen at random. Find the probability that this learner has a score of 10. Write the answer in its simplest form. [2]

Section 17 Trigonometry and Pythagoras.

1. [JSC P1 2013 Q21]

The diagram shows a right angled triangle.

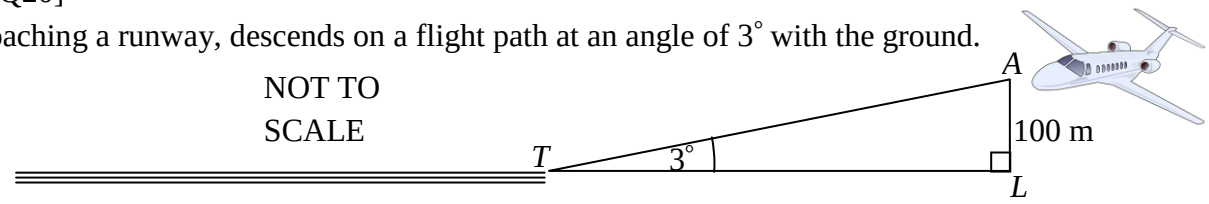


Determine the value of **(a)** sin $A\hat{B}C$, [1]

(b) tan $A\hat{C}B$ [1]

2. [JSC P2 2013 Q20]

An aircraft approaching a runway, descends on a flight path at an angle of 3° with the ground.

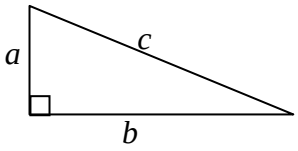


(a) Write down the size of angle *TAL*. [1]

(b) Calculate the length of *LT*, correct to the nearest metre. [3]

3. [JSC P1 2013 Q6]

The diagram shows a right angled triangle.



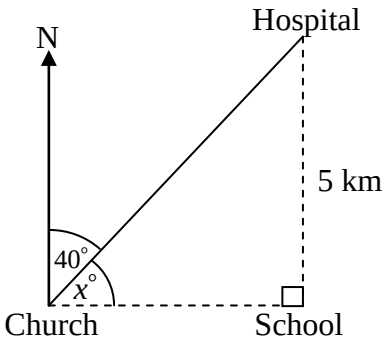
$c = \sqrt{a^2 + b^2}$ Calculate the value of c when $a = 24$ and $b = 10$.

4. [JSC P1 2014 Q16]

The diagram shows the locations of the church, school and hospital in a town.

The school is located to the east of the church.

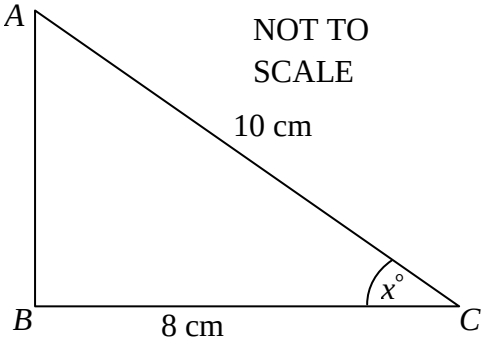
Use the diagram to answer the questions.



(a) Find the value of *x*. [1]

(b) Calculate the distance between the hospital and the church. [3]

5. [JSC P2 2015 Q16]



The diagram shows a right-angled triangle where $AC = 10$ cm and $BC = 8$ cm.

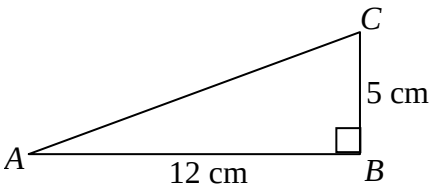
(a) Calculate angle *x*. [2]

(b) Find the length of side *AB*. [2]

6. [JSC P1 2015 Q26]

The diagram shows triangle *ABC*.

Calculate the length of *AC*. [2]



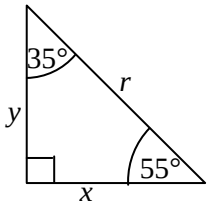
7. [JSC P1 2016 Q24]

A right angled triangle is shown.

In terms of *x*, *y* and/ or *r* write down the trigonometric ratio for

(a) cos 55° [1]

(b) tan 35° [1]



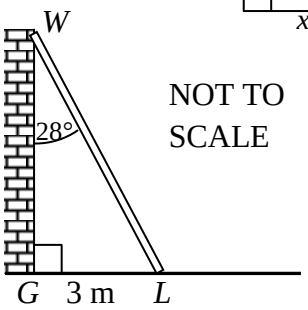
8. [JSC P2 2016 Q20]

A ladder (*LW*) leans against wall (*GW*).

G is west of *L*. Angle *GWL* is 28° and *GL* = 3 m.

(a) Write down the bearing of *L* from *G*. [1]

(b) Calculate the length of *LW*. [3]



Section 18 Comparing numbers and integers

1. [JSC P2 2013 Q1]

Put one of the symbols <, > or = in each statement so that the statement is correct.

(a) 5^3 ..... 3^5 [1]

(b) $-3-(-5)$ ..... $-3+(-5)$ [1]

(c) $9(17-8)$ ..... $9\times17-9\times8$ [1]

(d) $\frac{3}{4}$ ..... 0.6 [1]

2. [JSC P2 2014 Q3]

Choose one of the signs =; <; > to complete the following statements.

(a) $\frac{5}{8}$ ..... $\frac{5}{9}$ [1]

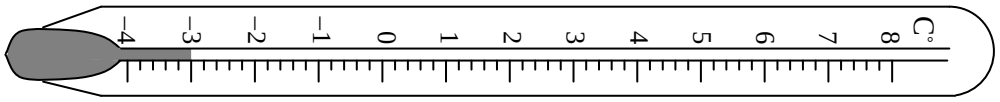
(b) $\frac{3}{4}$ ..... 75% [1]

(c) 6^2 ..... 2^6 [1]

(d) −3.7 .....−3.5 [1]

3. [JSC P1 2015 Q1]

The thermometer shows the temperature on one Monday morning in Windhoek.



What is the reading on the thermometer? [1]

4. [JSC P1 2015 Q2]

Arrange the following numbers, starting with the smallest number. 0.33 0.35 0.3 [1]

5. [JSC P1 2016 Q7]

Arrange the following fractions in **ascending** order $\frac{5}{3}$, $\frac{5}{2}$, $\frac{5}{7}$. [1]

6. [JSC P2 2016 Q4]

Place =; < or > between the following statements to make them true.

(a) 100 ..... 100^0 **(b)** $\frac{1}{7}$ .....$\frac{1}{3}$ **(c)** 0.375 ..... $\frac{3}{8}$ **(d)** 88%..... $\frac{7}{8}$ each [1]

Section 19 Interest and hire purchase.

1. [JSC P2 2013 Q7]

Mr. Prezzo invests N$4 800 at simple interest of 15% per annum for 3 years.

(a) Calculate the interest he will earn for 3 years. [2]

(b) Work out the total amount Mr. Prezzo will have at the end of 3 years. [1]

2. [JSC P2 2014 Q8]

Susan won N$5 000 from a competition. She invested $\frac{3}{4}$ of her money at 4% compound interest per year for 3 year.

Calculate **(a)** the amount invested by Susan, [2]

(b) the total amount she will have at the end of three years. [3]

3. [JSC P2 2015 Q7]

Rejoice bought a DVD player at a cash price of N$ 2660. James bought the same DVD player on hire purchase paying 20% deposit and a monthly instalment of N$165 for 16 months.

(a) Calculate the amount James paid for deposit. [2]

(b) Calculate the total amount James paid for the DVD. [2]

(c) Calculate how much more James paid for the DVD than Rejoice. [1]

4. [JSC P1 2015 Q15]

Ben invested N$800 at a rate of 5% compound interest per year. Calculate the total amount Ben has after 2 years. [2]

5. [JSC P1 2016 Q14]

Mokgane invests N$8 500 at 4.5% simple interest per year.

Calculate the interest Mokgane earned after 3 years. [2]

6. [JSC P2 2016 Q9]

A new car costs N$414 000. Aaron bought this car on Hire Purchase. He deposites N$40 000 and pays 60 monthly instalments of N$8 674. Calculate the total amount Aaron pays for the car. [2]

7. [JSC P2 2016 Q10]

Emma won N$200 000 in a competition. She used $\frac{4}{5}$ of her money to renovate her house.

She invested the rest of the money in the bank for 3 years at 8.5% compound interest per year.

(a) Calculate the amount Emma used to renovate her house. [2]

(b) (i) Calculate the amount that Emma invested in the bank. [1]

(ii) Calculate the total amount Emma will have after 3 years. [2]

Section 20 Interpretation of bills.

1. [JSC P2 2013 Q9]

The table shows Mr. Kaulinge's electricity bill.

City of Winhoek				
Mr. Kaulinge P O Box 4850 Windhoek			Account No: 1041052 Statement Date: 2012/04/21 Due Date:2012/05/15	
METER READING			DESCRIPTION	Amount
previous reading	current reading	units (kWh)	electricity consumption	N$578.00
31445	31665	**(a)**	basic electricity charges	**(b)**
			total amount due	N$601.45

Calculate, writing your answer in the table,

(a) the number of units of electricity that Mr. Kaulinge used. [1]

(b) the basic charges for electricity per month. [2]

(c) Mr. Kaulinge did not pay his account in time. The city of Windhoek charged him 12% interest on the total amount due. Calculate the total amount Mr Kaulinge paid after the interest was added. [2]

2. [JSC P2 2014 Q7]

The table shows a water and electricity bill for Ms. Damases.

WINDHOEK MUNICIPALITY			ACCOUNT PERIOD	
Ms. V P Damases			1 June 2013– 30 June 2013	
Electricity meter reading			**Description**	**Amount**
Previous	Current	Units used /kW	Electricity basic charge	N$340.00
92 475	92 795	**(a) (i)**	Electricity consumption	N$608.00
Water meter reading				
Previous	Current	Units used /kl	Water basic charge	N35.00
(a) (ii)	5885	31	Water consumption	N$201.50
Service renedered			Sewerage	**(b) (i)**
			Refuse removal	N$68.75
Property taxes: Value of the property: N$420000 × **(b) (ii)**				N$210.00
Total amount due				**N$1 486.90**

(a) Work out **(i)** the number of electricity units used, [1]

(ii) the previous water meter reading, [1]

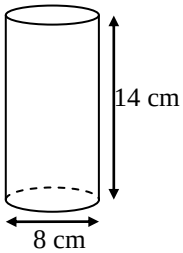
(iii) the water tariff (price) per kilolitre. [2]

(b) Calculate **(i)** the charges for the sewerage, [1]

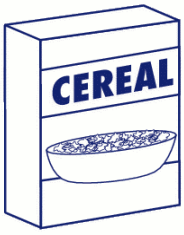
(ii) the rate used to calculate the property tax. Write your answer as a decimal fr. [2]

Section 21 Volume calculations and nets

1. [JSC P2 2013 Q10]The diagram shows four familiar objects, all shaped differently.

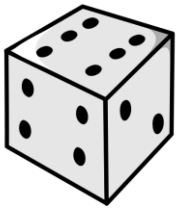


glass cup



cereal box


football


a dice

(a) Which of the above objects is **(i)** a cuboid **(ii)** a sphere 2×[1]

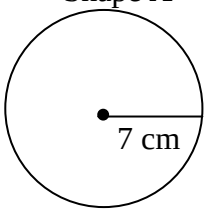
(b) Calculate the volume of the glass cup. [$\pi = \frac{22}{7}$] [3]

(c) Convert your answer in part **(b)** to litres. [1]

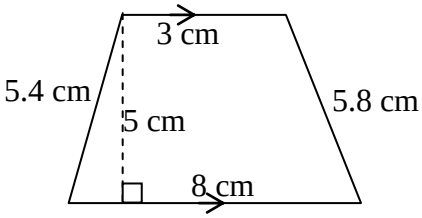
2. [JSC P1 2014 Q9]

The diagram shows 4 different shapes.

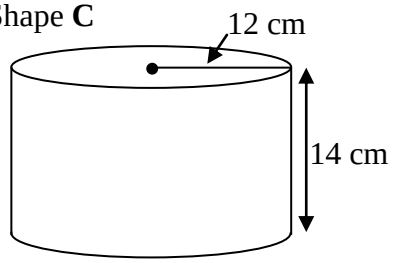
Shape **A**



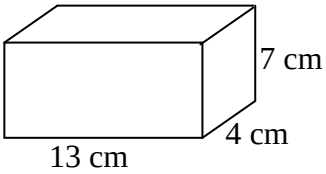
Shape **B**



Shape **C**



Shape **D**



(a) Calculate the circumference of shape **A. (**Use $\pi = \frac{22}{7}$) [2]

(b) Calculate the area of shape **B.** [2]

(c) Calculate the volume of shape **D**. [2]

(d) The volume of shape **C** is 6 333.5 cm^3. Write down the volume of shape **C** in litres. [1]

3. [JSC P1 2015 Q17]

The volume of a cube is 125 cm^3. Calculate the length of one of it sides. [2]

NOT TO SCALE

V = 125 cm^3

4. [JSC P1 2015 Q18]

Diagram 1 shows a cylinder and diagram 2 shows a triangular prism.

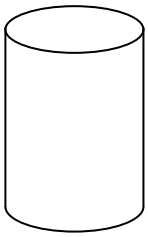


Diagram 1

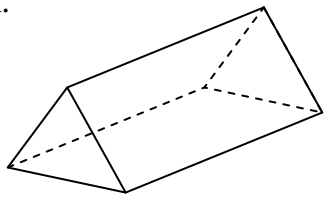


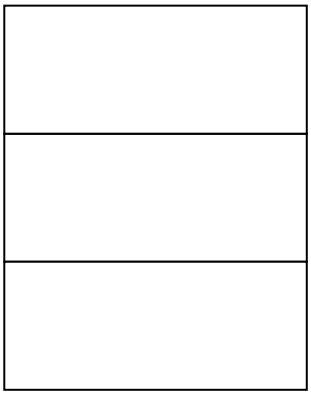
Diagram 2

NOT TO SCALE

Complete the nets: NOT TO SCALE

(a)

(b)



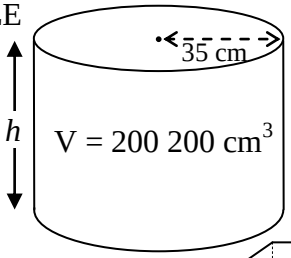
NOT TO SCALE

5. [JSC P2 2016 Q12]

(a) The volume of a cylindrical water container when full is 200 200 cm^3.

The water container has a radius of 35 cm. **(**Use $\pi = \frac{22}{7}$)

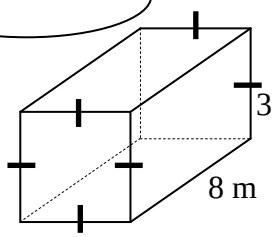
Calculate the height, *h*, of the container. [2]



(b) Atuhe Nursery school built a square-based cuboid on the play ground.

Its dimensions are 3 m by 3 m by 8 m.

Calculate the volume of the cuboid. [2]



Section 22 Probability

1. [JSC P2 2013 Q17]

The diagram shows nine cards, each with a different number.

One card is chosen at random. Find the probability that the number on the card is

(a) a 5, **(b)** a square number, **(c)** an odd number. [1] each.

2. [JSC P1 2012 Q18]

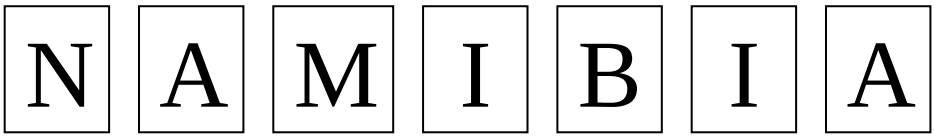
Loide writes the word Okakarara on the cards.

One card is randomly selected, what is the probability that the card has the letter **(a)** A [1]

(b) K [1]

3. [JSC P1 2015 Q28]

The letters of the name NAMIBIA are written on 7 cards as shown.



One of the cards is chosen at random.

Find the probability that the letter on the card is

(a) A, [1]

(b) P. [1]