

Core Question based on old exam papers

[Including 2016 papers]

ACKNOWLEDGEMENT IS GIVEN TO:
MINISTRY OF EDUCATION OF THE REPUBLIC OF NAMIBIA
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FOR AVAILING THE QUESTIONS FROM OLD EXAMPAPERS.



The Rössing Foundation

Note for the user: the question are selected from past examination papers and divided in 26 sections.
Answers to these questions are also available on the website of the Rössing Foundation..

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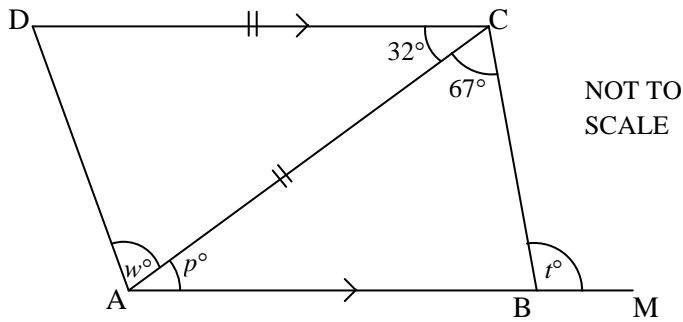
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Examination sample questions for all topics (Core level)

[question are all from past exams papers]

Section 1 Two dimensional shapes; quadrilaterals; angles and symmetry

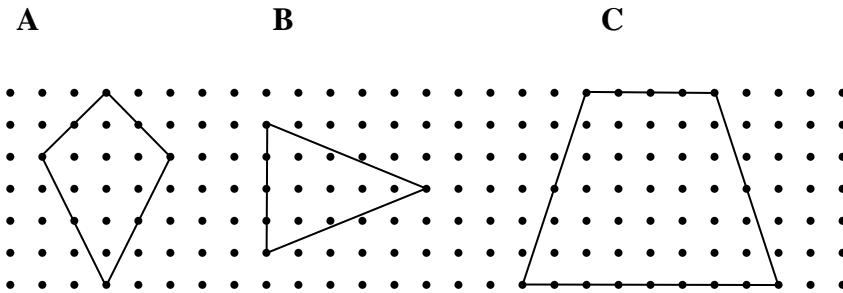
1. [P3 NSSC 2010 Q20]



NOT TO SCALE

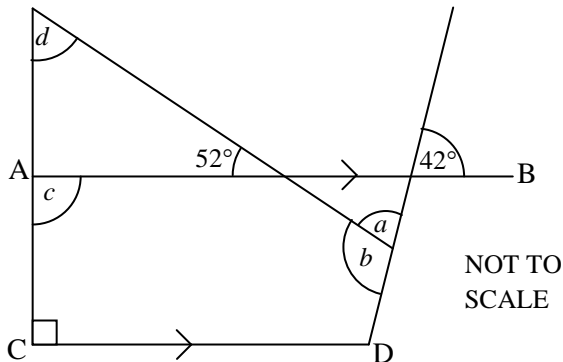
- (a) Write down the name of the quadrilateral ABCD
- (b) Find the value of p ; t and w and give reasons.

2. [P1 NSSC 2010 Q13]



- (a) In each of the shapes above draw **one** line which divides it into two congruent shapes. [3]
- (b) Name the three shapes. [2]

3. [P3 NSSC 2010 Q17]



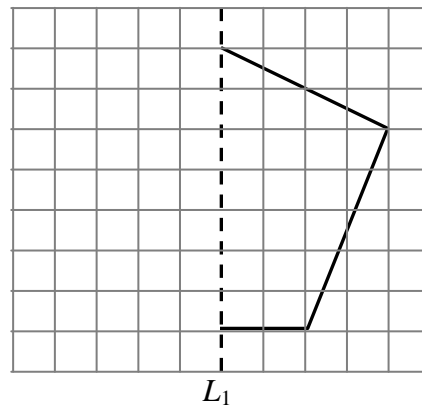
NOT TO SCALE

In the given figure line AB is parallel to CD and the two angles indicated 42° and 52° are given.

Calculate angle a ; b ; c and d . [2], [1], [1], [1]

4. [P1 NSSC 2013 Q21 (ab)]

- (a) In the diagram the L_1 , is a line of symmetry for the partly drawn polygon. Complete the partly drawn polygon in the diagram.



- (b) What is the special name of the complete drawn polygon?

[2]

[1]

5. [P3 NSSC 2013 Q7]

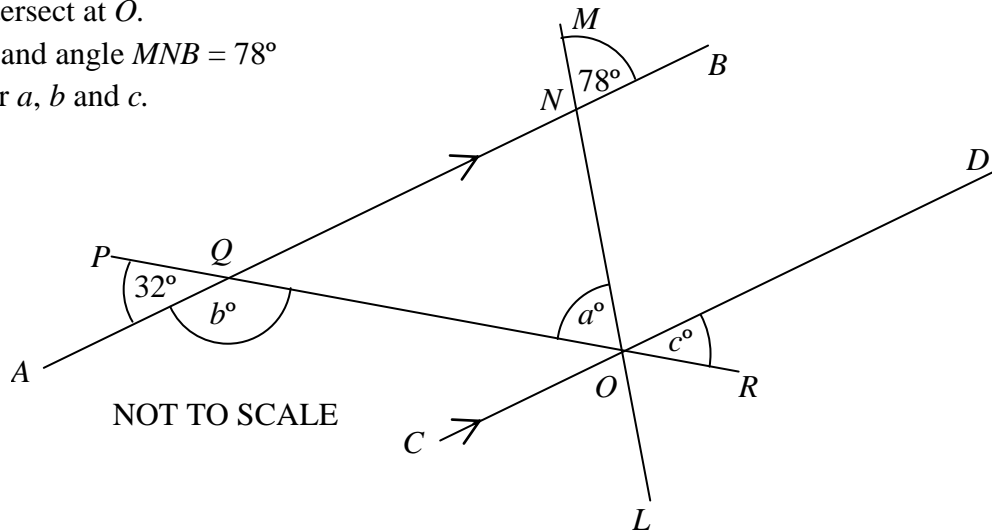
AB and CD are two parallel lines.

PQR and MNL intersect at O .

Angle $AQP = 32^\circ$ and angle $MNB = 78^\circ$

Find the values for a , b and c .

[3]



6. [P1 NSSC 2014 Q20]

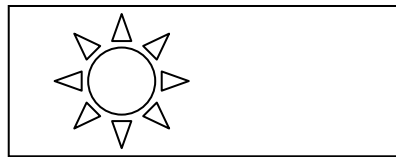
Draw in the lines of symmetry in Figure A and Figure B.

(a) Figure A



[2]

(b) Figure B



[1]

(c) (i) What is the name of Figure A?

[1]

(ii) Write down the order of rotational symmetry of Figure A.

[1]

7. [P1 NSSC 2015 Q18]

Davey wrote the word “shape” with capital letters as

S H A P E

(a) Draw the line(s) of symmetry on letter H.

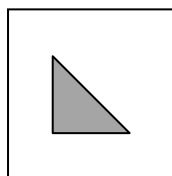
[1]

(b) Write down a letter which has no line of symmetry but has rotational symmetry of order 2.

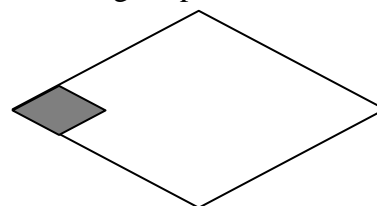
[1]

8. [P1 NSSC 2016 Q7] Draw the line(s) of symmetry in the following shapes.

Shape A



Shape B



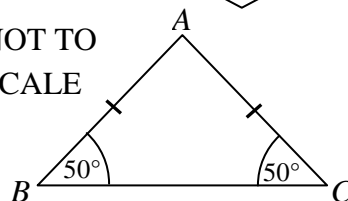
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9. [P1 NSSC 2016 Q 19]

In triangle ABC , angle $ABC =$ angle $BCA = 50^\circ$.

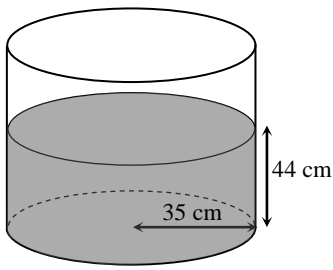
Calculate the size of angle BAC .

[2]



Section 2 Three dimensional shapes; nets and volume and area calculations.

1. [P1 NSSC 2010 Q18]



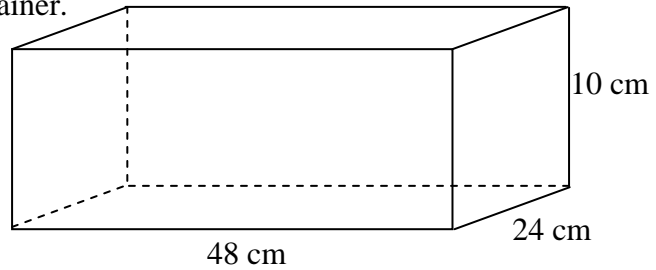
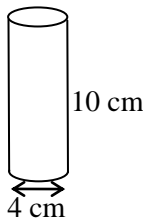
A cylindrical tank, with radius 35 cm, is filled with water to a depth of 44 cm.

- (a) Calculate the area of the base of the tank. [2]
- (b) Calculate the volume of water in the tank. [1]
- (c) Change your answer to **part (b)** in litres. [1]

2. [P3 NSSC 2013 Q9]

The diagram shows a cylindrical tablet container with a diameter of 4 cm and a height of 10 cm.

(a) Calculate the volume of one cylindrical container. [2]



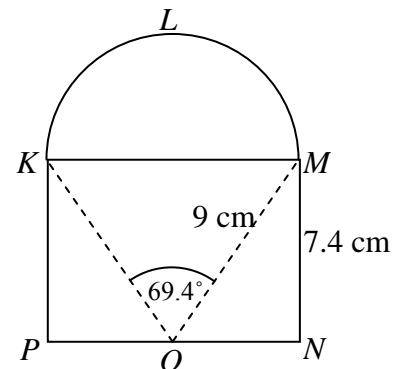
(b) The cylindrical containers are packed in a box that is in the shape of a cuboid. The box is 48 cm long, 24 cm wide and 10 cm high.

- (i) How many cylindrical containers can be packed in the box? [2]
- (ii) Calculate the volume of the box. [2]
- (iii) Find the volume of the empty space in the box filled with tubes. [2]
- (c) Calculate the surface area of the carton used to make the box. [2]

3. [P3 NSSC 2014 Q4]

The diagram shows a cross section $KLMNOP$ of a treasure chest. $KMNP$ is a rectangle and KLM is a semi-circle. O is the midpoint of PN . $KP = MN = 7.4$ cm, $OM = 9$ cm and angle $KOM = 69.4^\circ$.

- (a) (i) Find angle MON [2]
- (ii) Calculate the length of ON . [2]
- (iii) Show that the width of the treasure chest, $PN = 10.24$ cm [1]
- (b) Calculate the area of (i) rectangle $KMNP$, [2]
- (ii) the semicircle KLM , [2]
- (iii) the cross section of the chest. [1]

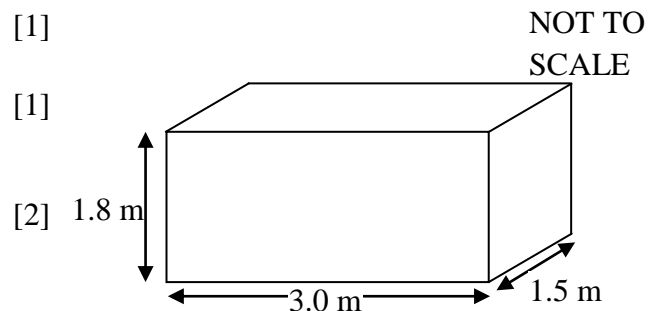


(c) The chest is 15 cm long. Calculate the volume of the treasure chest. [2]

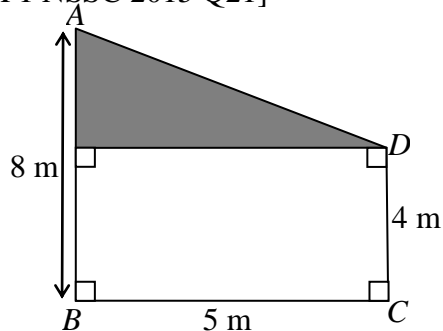
4. [P1 NSSC 2014 Q18]

Dimension stones like marble and granite are being cut and polished at plants in Karibib and Omaruru in Namibia. The diagram illustrates the size of a granite block.

- (a) Calculate the volume of the block. [1]
- (b) A granite tile has a volume of $9 \times 10^{-3} \text{ m}^3$ [1]
- (i) Write 9×10^{-3} as a decimal. [1]
- (ii) Use your answer in (a) and part (b) (i) to calculate the number of tiles that can be cut from the granite block. [2]



5. [P1 NSSC 2015 Q21]



- (a) Give the special name for shape $ABCD$. [1]
 (b) Calculate the shaded area. [2]

Section 3 Accuracy; standard form and significant figures; calculations & calculator skills

1. [P1 NSSC 2013 Q 5]

The Okavango River in the north of Namibia is about 1600 km long. Write 1600 km in standard form. [1]

2. [P1 NSSC 2013 Q 7] Calculate $\frac{2.6+3.8}{4.1}$

- (a) Write down your full calculator display. [1]
 (b) Round your answer in (a) to one significant figure. [1]

3. [P1 NSSC 2013 Q 13]

The height, h of the highest mountain peak in Africa, Mt Kilimanjaro is 5900 m correct to the nearest 100 meters. Complete the statement for this height: \leq height, $h <$ [2]

4. [P1 NSSC 2014 Q1] Work out $2 \times 6 - 4 \times 2$ [1]

5. [P1 NSSC 2014 Q4]

Over a period of 30 months, 111 488 vehicles crossed the border from South Africa to Namibia in Noordoever.

- (a) Write 111 488 correct to 2 significant figures. [1]
 (b) Calculate the average number of vehicles crossing the border per month for the 30 month period. [2]
 (c) Write 30 months in years. [1]

6. [P1 NSSC 2014 Q16]

- (a) The area of the Etosha National Park. To the nearest 1000 km^2 is 23 000 km^2 .
 Completer the statement: \leq area $<$ [2]
 (b) The area of the Etosha Pan is 4 730 km^2 .
 Write the area of the Etosha Pan as a percentage of the Etosha National Park. [2]
 (c) The Etosha National Park gets approximately 200 000 visitors annually.
 Write 200 000 in standard form. [1]

7. [P1 NSSC 2015 Q1] (a) Find $\sqrt{81}$ [1]
 (b) Find the integer closest to $\sqrt{125}$ [1]

8. [P1 NSSC 2015 Q3]

Fill in the missing number in each of the open spaces provided below.

- (a) - 44 = 38 [1]
 (b) $13 \times$ = 65 [1]
 (c) $72 \div$ = 6 [1]

9. [P1 NSSC 2015 Q6]

On a certain winter day, the temperature in city B was -21°C and the temperature in city F was -5°C .

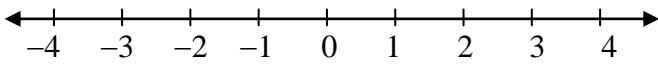
- (a) Find the difference in the temperature in city B and the temperature in city F. [1]
 (b) Which city was warmer? [1]

10. [P1 NSSC 2015 Q7]
The cockroach, which has been around for 200 million years, is the fastest ground insect on six legs.
Write 200 million years in standard form. [1]
11. [P1 NSSC 2015 Q8]
The distance between Walvis Bay and Swakopmund is 31 kilometres, to the nearest kilometre.
If the actual distance is d kilometres, complete the inequality:km $\leq d <$ km [2]
12. [P1 NSSC 2015 Q14]
(a) (i) Write both numbers, 185 and 35, correct to **one significant figure.** [1]
(ii) Use your answers in part (i) to **estimate** the value of $185 \div 35$ [1]
(b) Use your calculator to find the value of $185 \div 35$ correct to **two decimal places.** [1]
13. [P1 NSSC 2016 Q 12]
(a) Fill in the empty boxes in the squares to the right so that each row, each column and each diagonal adds up to 0. [2]
(b) Find the product of the three numbers on the top row. [1]
- | | | |
|----|---|----|
| -2 | 5 | -3 |
| | 0 | |
| 3 | | |
14. [P3 NSSC 2016 Q1abd]
(a) Calculate $17 - 9 \div 3 + 6$ [1]
(b) Write 4 359 (i) to the nearest 10 [1]
(ii) correct to 2 significant figures. [1]
(c) The distance, d km, between Windhoek and Swakopmund is given as 350 km to the nearest 10 km. Complete the following statement to find the upper and lower bound of the distance.
..... km $\leq d <$ km [2]

Section 4 Algebra I: expansion; changing the subject of the formula and substitution.

1. [P1 NSSC 2010 Q8] $v = \frac{4t}{3}$
(a) Find v when $t = 12$
(b) Make t the subject of the formula.
2. [P1 NSSC 2010 Q12]
When $x = -3$ and $y = 2$, find the value of
(a) $x + y$ [1] (b) $y - x$ [1] (c) $x^3 + 2x^2$. [2]
3. [P3 NSSC 2010 Q4]
A number, a , is equal to two times the square of another number b .
(a) Represent this information as an algebraic equation. [1]
(b) Given that b is positive, find the value of b when $a = 18$. [2]
4. [P1 NSSC 2013 Q6] Expand the following expression: $3a(2a - 4b)$ [2]
5. [P1 NSSC 2015 Q11]
(a) Factorize completely $3x^2 - 6x$ [2]
(b) Find the value of $3x^2 - 6x$ when $x = 3$. [1]
6. [P1 NSSC 2016 Q16] Multiply out $5x(2x - 3y)$. [2]
7. [P1 NSSC 2016 Q 18] Make x the subject of the formula $2x - y = 5$. [2]

Section 5 Algebra II: factorization; simplification; linear and quadratic eq. & inequalities

1. [P3 NSSC 2010 Q4 (b)]
- (a) Factorise completely $2y + 8y^2$ [2]
- (b) Solve this equation $36 = 4(x - 3)$ [2]
- (c) Solve for x : $(x - 7)(x + 3) = 0$ [2]
- (d) Solve for y : $(2y - 6)(y + 5) = 0$ [2]
2. [P1 NSSC 2013 Q 9] Factorise completely $4x^2 + 12xy$ [2]
3. [P3 NSSC 2013 Q 4]
- (a) Show the inequality $-2 < x \leq 3$ on the given number line. [2]
- 
- (b) Choose one of the following symbols, $<$, $>$ or $=$ to make the following statements true when $m = -7$ and $n = 4$.
- (i) m n [1]
- (ii) m^2 n^2 [1]
4. [P3 NSSC 2013 Q 5]
- (a) The sum of the following three consecutive numbers, n , $n + 1$, $n + 2$ is 36.
- (i) Use the information to form an equation in n . [1]
- (ii) Solve for n and write down the three numbers. [3]
- (b) Solve for a : $(a - 2)(a + 5) = 0$ [2]
5. [P3 NSSC 2014 Q 8]
- Jaco works at a restaurant at night. He earns a total of N\$ w per night. He is paid a fixed amount per hour and works for h hours. Jaco also receives tips to the amount of N\$ t .
- The formula for w is $w = 25h + t$.
- (a) Write down the fixed amount per hour that Jaco earns. [1]
- (b) On a certain night Jaco worked for 4 hours and received tips to a total of N\$60. How much did Jaco earn on this particular night? [2]
- (c) Make h the subject of the formula. $w = 25h + t$ [2]
6. [P1 NSSC 2014 Q 7] Factorize completely $4xy + 3x$ [2]
7. [P1 NSSC 2014 Q 9] Solve the equation $8x + 7 = 31$ [2]
8. [P1 NSSC 2016 Q 5] Simplify the following expression $2a + 3b + 5a - 7b$. [2]
9. [P1 NSSC 2016 Q 26]
- George thinks of a number, x . He multiplies it by 2 and then subtracts 5.
- (a) Write this information as an expression in terms of x . [1]
- (b) The expression in part (a) is equal to 10. Write down an equation and solve it for x . [2]
10. [P3 NSSC 2016 Q 8]
- (a) Solve for x if $\frac{x}{4} = 6$. [1]
- (b) Solve the equation $5(a - 4) = 3a + 14$. [3]

Section 6 Algebra III: simultaneous equations and exponents.

1. [P1 NSSC 2013 Q 16]
- Solve the following simultaneous equations
- $$2x - y = 6$$
- $$3x + y = 14$$
- [3]
2. [P1 NSSC 2014 Q 5] Simplify $3x^2 \times 2x^3$ [2]

3. [P1 NSSC 2014 Q 10]
Put one of the symbols $<$, $>$ or $=$ in each part to make the statements correct.
- (a) 2^3 3^2 [1]
 (b) 2^{-3} 3^{-2} [1]
 (c) 2^0 3^0 [1]
4. [P1 NSSC 2014 Q 13]
Solve the following simultaneous equations. $7x - 3y = 13$
 $4x - 3y = 7$ [3]
5. [P1 NSSC 2015 Q 12]
Simplify $\frac{24x^{18}}{16x^9}$ [2]
6. [P1 NSSC 2015 Q 13]
Solve the following simultaneous equations. $3x + y = 5$
 $2x + y = 1$ [2]
7. [P1 NSSC 2016 Q 21] Solve the following simultaneous equations. $x + y = 18,$
 $4x + 8y = 52.$ [3]

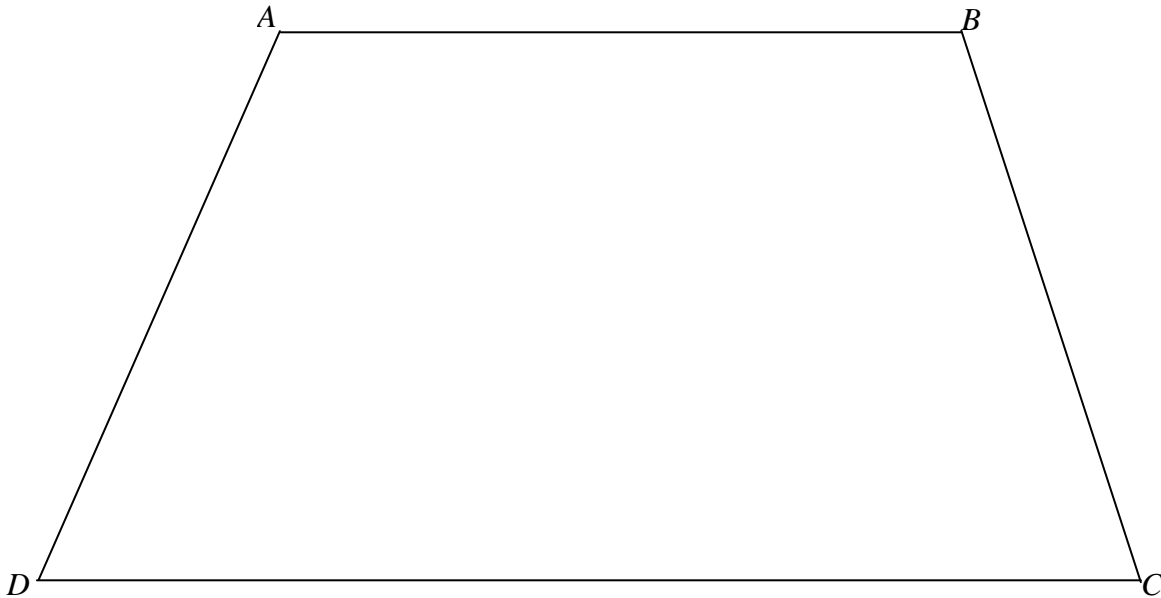
Section 7 Distant time graph; average speed and duration

1. [P3 NSSC 2010 Q10(b)]
Johannesburg is 1 400 km from Windhoek. It took Mr. Hengari 15 hours and 30 minutes to reach Johannesburg. Calculate his average speed for the journey. [2]
2. [P1 NSSC 2013 Q 10]
A bus travelled 350 kilometres in 4 hours 18 minutes. Calculate the average speed of the bus. [2]
3. [P1 NSSC 2013 Q 12]
Brandon started a race at 9 : 30 a.m. and he crossed the finish line at 1: 05 p.m.
How long did it take for Brandon to finish the race? [1]
4. [P3 NSSC 2014 Q 2(b)]
At a fun day people could walk certain distances for fun.
- (i) Roger started walking at 07:15 and reached the finish by 08:10. For how long did he walk? [1]
 (ii) The distance Roger walked was 5 km. Calculate his average speed, giving you answer in km/h.[2]
5. [P1 NSSC 2016 Q 6]
Petrus leaves Outjo at 08:12 and arrives in Windhoek at 11:57. How long did the journey take? [2]

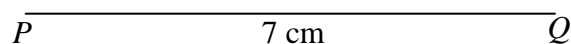
Section 8 Construction and locus.

1. [P3 NSSC 2010 Q6]
The interior angle of a regular pentagon is 108° .
- (a) Draw accurately a regular pentagon $ABCDE$ with sides 6 cm.
- (b) Using a ruler and compasses only, construct accurately
- (i) the bisector of angle B . [2]
 (ii) the perpendicular bisector of the side BC . [2]
- (c) Mark P , the point of intersection of the two lines drawn in (b) (i) and (b) (ii), and measure PC . [1]

2. [P3 NSSC 2014 Q9] The diagram shows the trapezium $ABCD$ which has been drawn accurately to scale.



- (a) Measure and write down
- | | | |
|--|--------------------------------|-----|
| | (i) the length DC , | [1] |
| | (ii) the size of angle ABC . | [1] |
- (b) Construct accurately the locus of all points
- | | | |
|---|--|-----|
| (i) that are 2 cm from DC inside the trapezium $ABCD$, | | [2] |
| (ii) that are the same distance from points D and C , | | [2] |
| (iii) that are equidistant from AB and BC . | | [2] |
3. (a) Construct accurately triangle PQR in which $PQ = 7$ cm, $QR = 8$ cm and $PR = 6$ cm.
Line PQ has been drawn for you.



- (b) Measure and write down angle PQR . [1]
- (c) Using a straight edge and compasses only, construct
- | | | |
|--|--|-----|
| (i) the perpendicular bisector of line PQ , | | [2] |
| (ii) the locus of points inside triangle PQR , which are equidistance from PR and PQ . | | [2] |
- (d) The perpendicular bisector of line PQ in part (c) (i) meets QR at X . Measure the length of QX . [1]

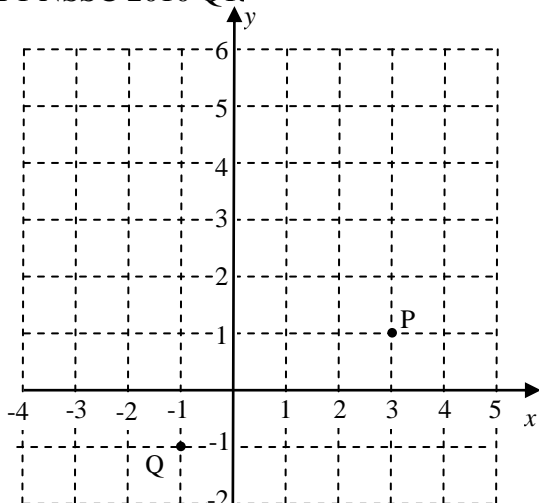
Section 9 Finance: Bills; profit & loss; exchange and interest.

1. [P1 NSSC 2010 Q 7] Shadida buys a dress costing N\$27.40 and a scarf costing N\$5.68. She pays with a N\$50 note. How much change should she receive?
2. [P3 NSSC 2010 Q 10(a)]
Mr Hengari went from Windhoek to Johannesburg via Botswana. He needed to change N\$1 500 to Botswana pula when the rate was N\$1 = 1.05 Pula.
Calculate the amount of pula's he received. [2]
4. [P1 NSSC 2013 Q 1]
Calculate N\$30 – N\$6.45 [1]

4. [P3 NSSC 2013 Q 3]
- (a) Joseph changes his 4550 pula to Namibian dollars when the exchange rate is 1 pula = N\$1.12.
Calculate the amount he receives/ [2]
- (b) Karin invests N\$20 000 in a fund which pays 5% per year compound interest.
Calculate the amount that Karin will have after two years. [3]
- (a) Viana buys a motor cycle for N\$135 000. After 3 years he sells the motor cycle for 15% less than he paid for it. Calculate the selling price of the motor cycle. [2]
5. [P3 NSSC 2014 Q 2(acd)]
- (a) At a school Fun Day in 2012, pancakes were sold for N\$3.50 each.
- (i) The Old Age Home ordered 113 pancakes. How much did they pay for the pancakes? [1]
- (ii) In 2011 the pancakes were sold for N\$3. Calculate the percentage increase in the price Of the pancakes from 2011 to 2012. [2]
- (c) Mr. Buys bought 3.2 kg of minced for N\$21.60. Calculate the price per kilogram for the mince. [1]
- (d) A 250 g packet of cookies were sold for N\$20. Calculate the price of 3.5 kg of cookies. [2]
6. [P3 NSSC 2015 Q 7]
- The cash price of a motorcycle is N\$25 000. To buy the motorcycle on hire purchase, you must pay a deposit of 10% and instalments of N\$1 200 per month for 24 months.
- (a) Mr Kandetu decides to buy the motorcycle on hire purchase.
- (i) Calculate the deposit Mr Kandetu has to pay. [2]
- (ii) Find the total amount he has to pay in instalments. [1]
- (iii) Calculate the total amount he has to pay for the motorcycle. [1]
- (b) Find the difference between the cash price and the hire purchase price. [1]
7. [P1 NSSC 2015 Q 10]
- Tracy buys a box which contains 36 packets of chips for N\$93.60 to sell in her shop. She sells all the packets of chips for N\$3.12 each.
- (a) Work out her total profit. [1]
- (b) Work out her percentage profit. [2]
8. [P1 NSSC 2016 Q13] A radio taxi driver charges a basic fee of N\$3.50 plus N\$2.50 per kilometre. Calculate the total amount charged for a 12 kilometres trip. [2]
9. [P1 NSSC 2016 Q 20]
- Elizabeth invests N\$5 200 for 3 years at a rate of 8% per year simple interest . Calculate the total interest that Elizabeth will receive after 3 years. [2]
10. [P3 NSSC 2016 Q 2]
- Mr. Kambala earns N\$2 500 in a 5day week and spends N\$21 on transport daily.
- (a) Calculate the amount of money he earns a day. [2]
- (b) Calculate the amount of money he spends on transport per week. [2]
- (c) The employer of Mr. Kambala decides to increase his earnings by 15% per week. Calculate his new weekly earnings. [2]

Section 10 Vectors

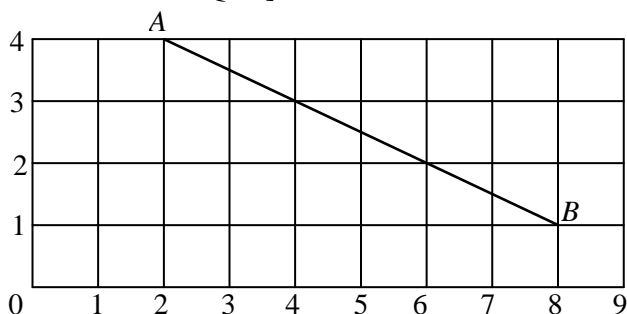
1. [P1 NSSC 2010 Q131]



The points P(3,1) and Q(-1,-1) are marked on the grid.

- (a) Write down \overrightarrow{QP} [1]
- (b) R and S are two more points, $\overrightarrow{PR} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$ and $\overrightarrow{PS} = 3\overrightarrow{PR}$
- (i) Write down the vector \overrightarrow{PS} . [1]
- (ii) Mark the point S on the grid. [1]

2. [P1 NSSC 2010 Q 19]



- (a) Write down \overrightarrow{AB} as a column vector [1]

- (b) It is given that $\overrightarrow{AC} = \frac{1}{3}\overrightarrow{AB}$

Mark the point C on the diagram. [1]

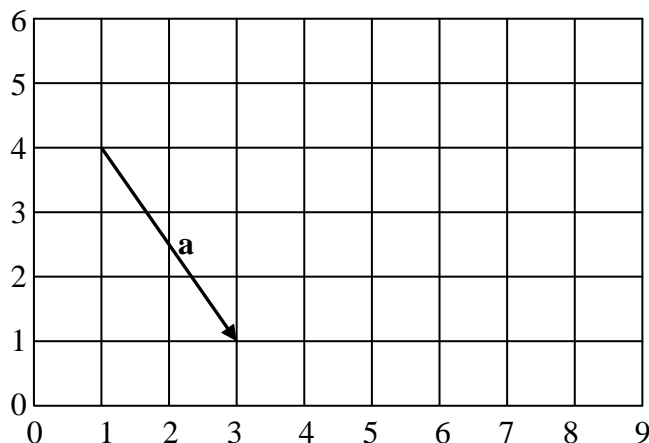
3. [P1 NSSC 2013 Q 20]

Vector is drawn on the grid.

- (a) Write down \mathbf{a} as a column vector. [1]

- (b) Vector $\mathbf{b} = \begin{pmatrix} 5 \\ 4 \end{pmatrix}$. Draw vector \mathbf{b} anywhere [1]
on the grid.

- (c) Write down the vector $2\mathbf{b}$ in column notation. [1]



4. [P1 NSSC 2015 Q 20]

The two vectors \mathbf{x} and \mathbf{y} are given by $\mathbf{x} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$

and $\mathbf{y} = \begin{pmatrix} -4 \\ 0 \end{pmatrix}$ Calculate:

- (a) $\mathbf{x} + \mathbf{y}$

- (b) $\frac{1}{2}\mathbf{y}$

5. [P1 NSSC 2016 Q 25]

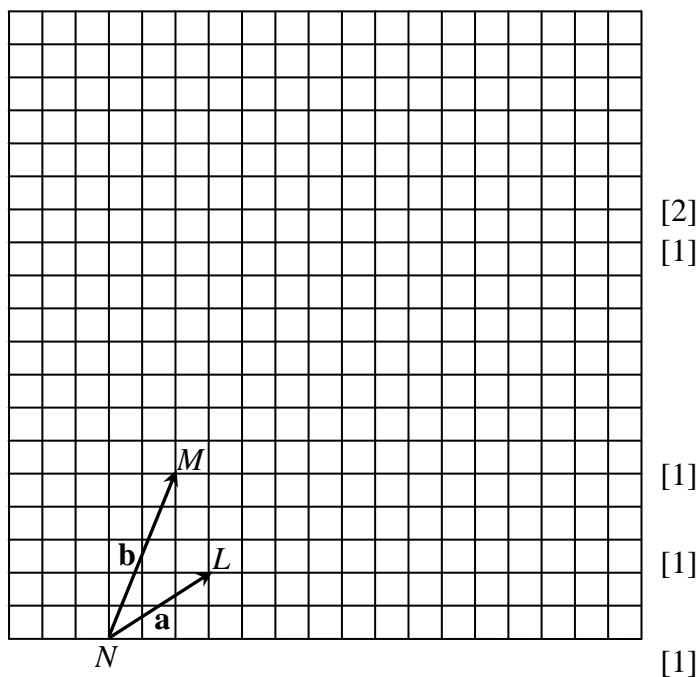
In the diagram, $\overrightarrow{NM} = \mathbf{b}$ and $\overrightarrow{NL} = \mathbf{a}$.

- (a) Write \overrightarrow{NL} as a column vector: $\begin{pmatrix} \\ \end{pmatrix}$ [2]

- (b) $\overrightarrow{NQ} = 2\mathbf{a}$. Mark point Q on the diagram. [1]

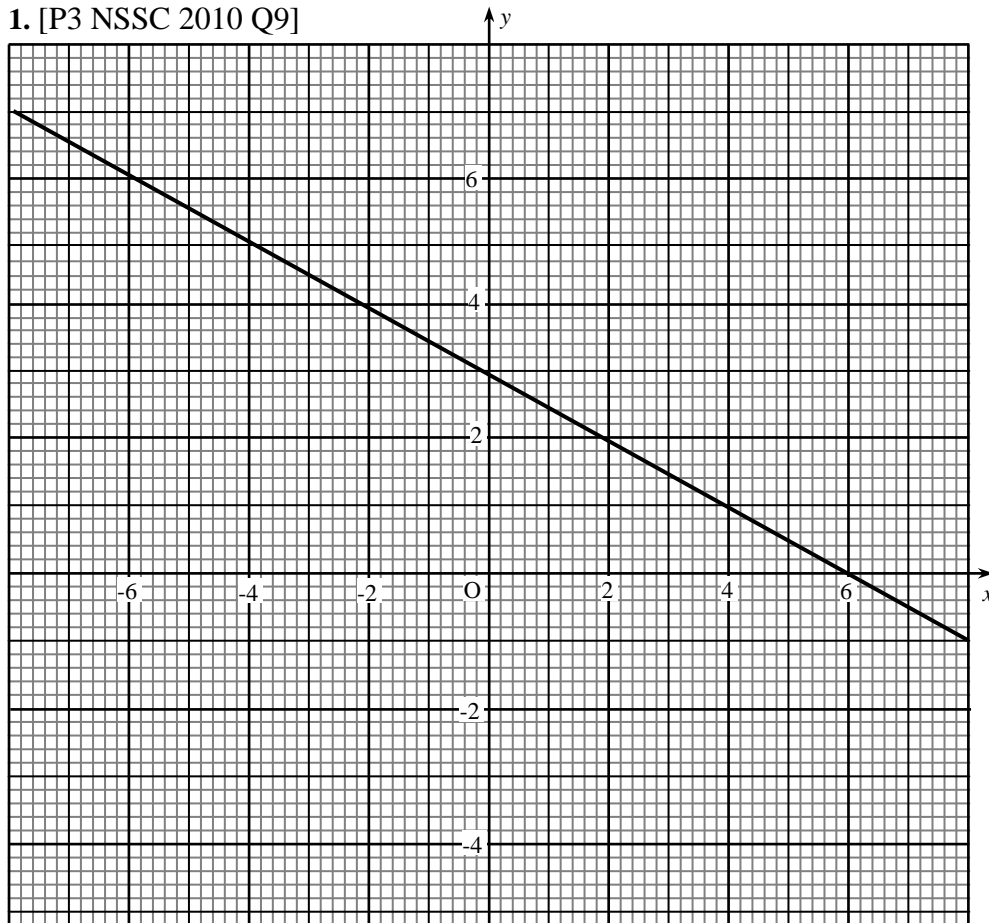
- (c) $\overrightarrow{NR} = \mathbf{a} + \mathbf{b}$

Mark point R on the diagram. [1]



Section 11 graphs: linear; quadratic and hyperbola.

1. [P3 NSSC 2010 Q9]



The graph of $x + 2y = 6$ is drawn on the grid above.

(a) Find the gradient of the straight line $x + 2y = 6$. [2]

(b) (i) Complete the table below when

$y = \frac{3}{2}x - 3$ [2]

x	0	2	4
y			

(ii) Draw the graph of $y = \frac{3}{2}x - 3$ on the grid to the left. [2]

(c) Use the graph to solve the simultaneous equations

$$x + 2y = 6.$$

$$y = \frac{3}{2}x - 3$$
 [2]

2. [P1 NSSC 2013 Q 25]

The conversion graph indicates the difference in temperature between degrees Celsius and degrees Fahrenheit.

Use the graph to convert the following temperatures.

(a) How many degrees Fahrenheit is 10°C ? [1]

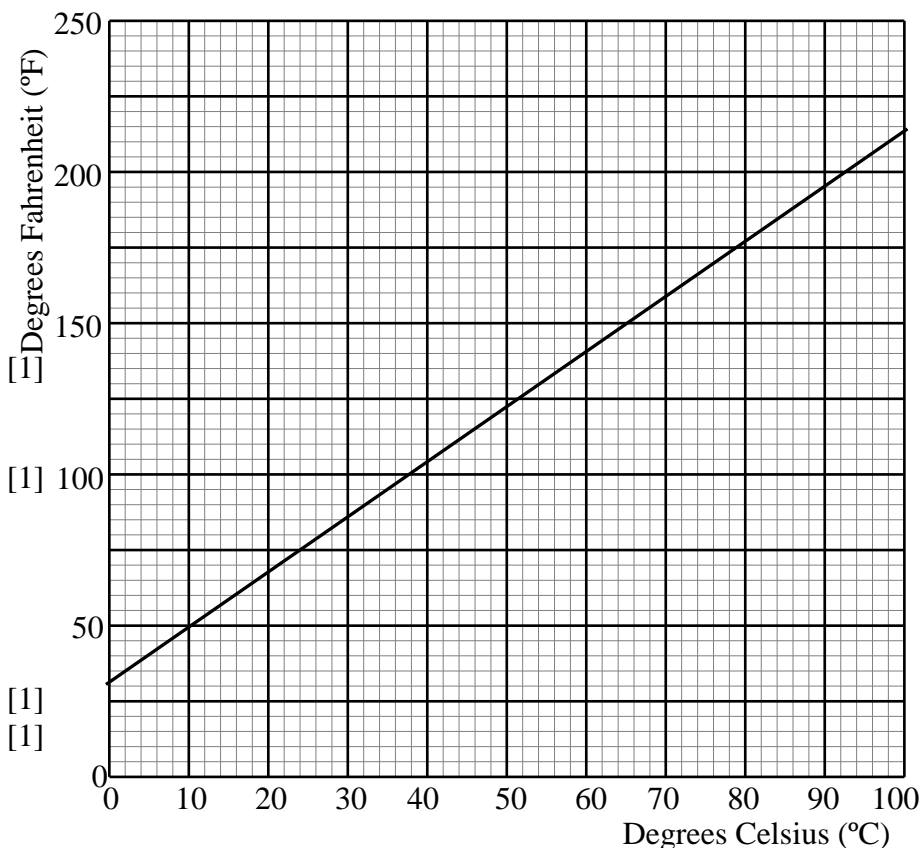
(b) How many degrees Celsius is 150°F ? [1]

(c) Water freezes at 0°C and boils at 100°C . Use your graph to estimate at how many degrees Fahrenheit does water

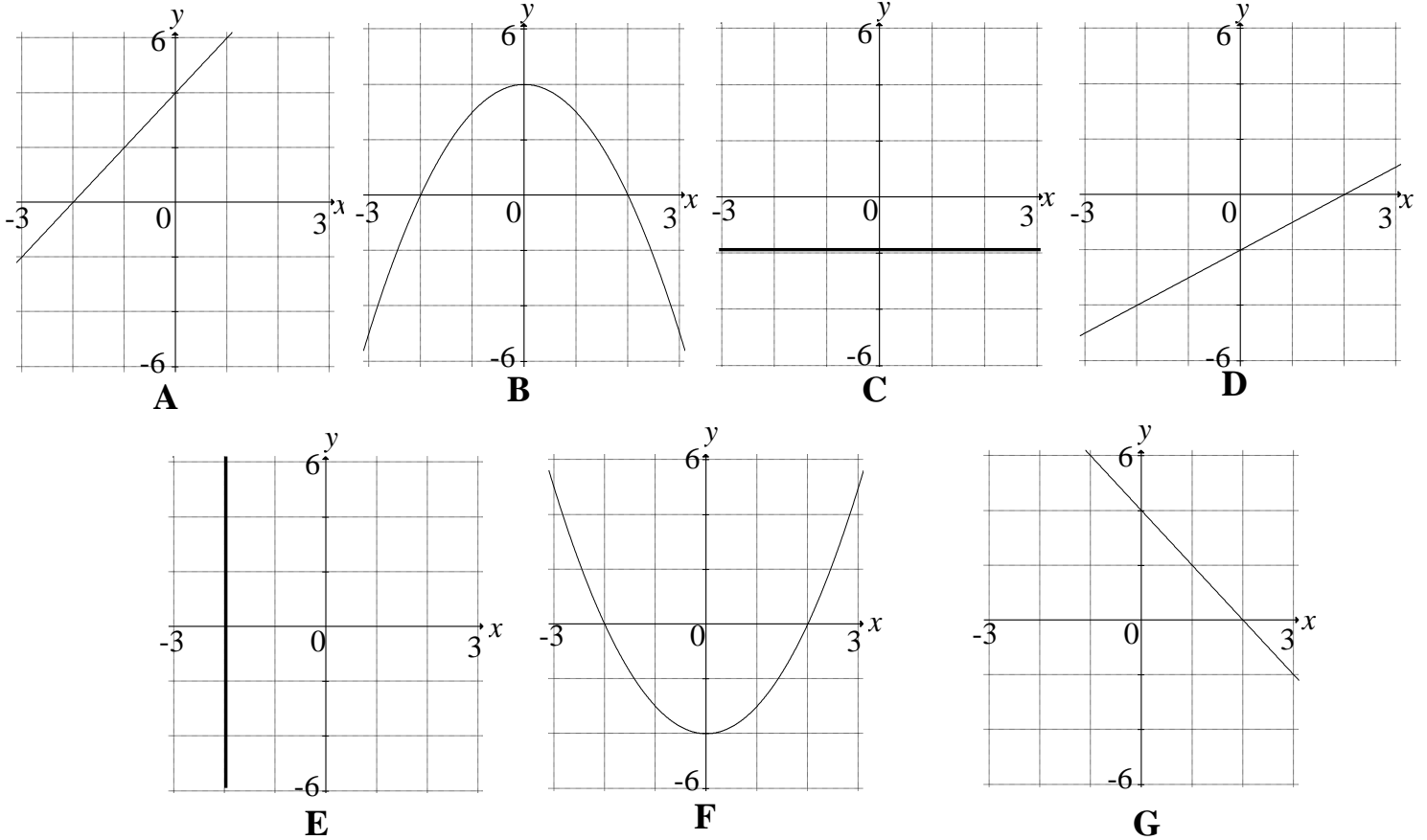
(i) freeze, [1]

(ii) boil? [1]

Conversion graph: degrees Fahrenheit-degrees Celsius



3. [P3 NSSC 2013 Q11]



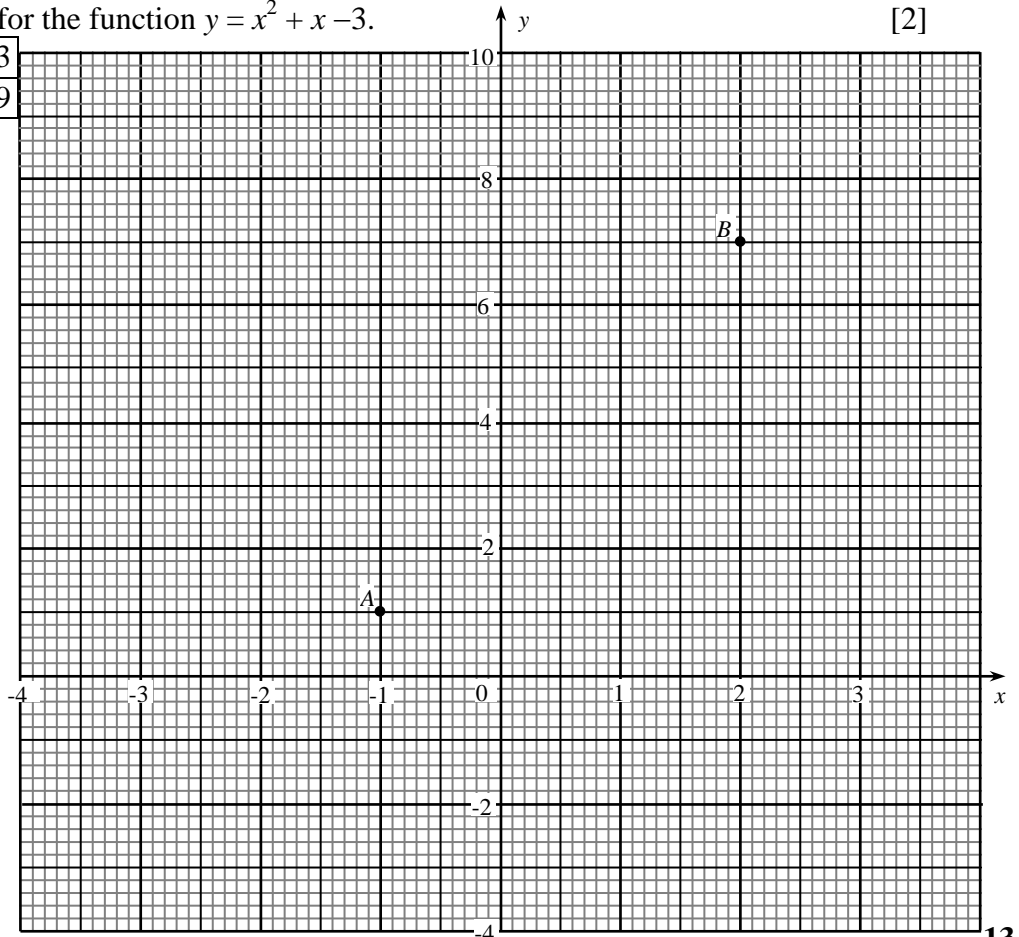
- (a) Write down the letter of the graph that represents the equation $y = x^2 - 4$ [1]
- (b) Write down the equation of the straight line represented by the graph in diagram C. [1]
- (c) Write down the letter of the graph represented by $y = -2x + 4$. [1]
- (d) Write down the coordinates of the turning point of the curve represented on diagram B. [2]
- (e) Write down the gradient of the straight line represented by the graph in diagram A. [1]

4. [P3 NSSC 2014 Q7]

(a) (i) Complete the table below for the function $y = x^2 + x - 3$. [2]

x	-4	-3	-2	-1	0	1	2	3
y		3	-1	-3			3	9

(ii) On the grid, draw the graph for $y = x^2 + x - 3$ for $-4 \leq x \leq 3$. [4]



- (a) Two points A and B are marked on the grid.
- (i) Draw a straight line through the points extending it to the edge of the grid. [1]
 - (ii) Write down the coordinates of the points of intersection of a straight line and your graph. [2]
 - (iii) Write down the gradient of the line AB . [2]
 - (iv) Write down the equation of the straight line through the points A and B , in the form of $y = mx + c$. [2]

5. [P3 NSSC 2015 Q14]

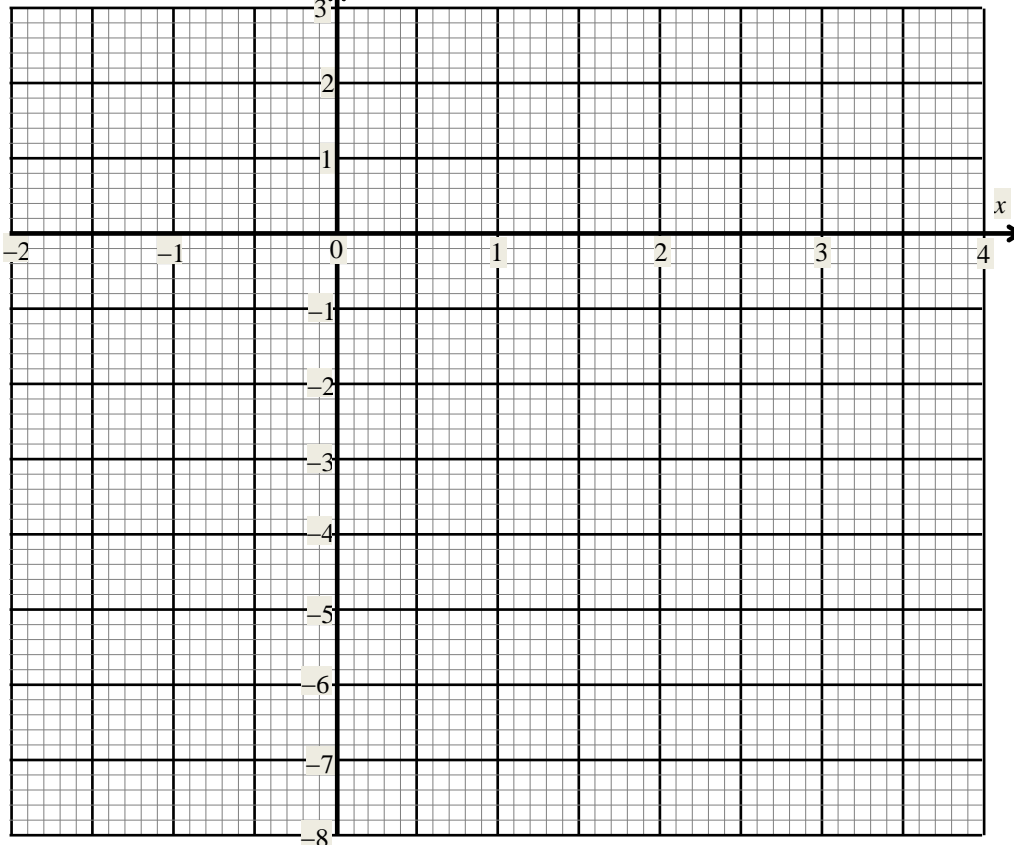
- (a) (i) Complete the table of values below for the function $y = 2x - x^2$.

x	-2	-1	0	1	2	3	4
y		-3	0	1		-3	

[3]

- (ii) Draw the graph of $y = 2x - x^2$ on the grid below for $-2 \leq x \leq 4$.

[3]



- (a) (i) Complete the table of values below for the equation $y = -\frac{3}{2}x + 2$.

x	0	2	4
y	2	-1	

[1]

- (ii) On the grid above draw the graph of $y = -\frac{3}{2}x + 2$ for $0 \leq x \leq 4$

[2]

- (b) Use the graph to solve $2x - x^2 = -\frac{3}{2}x + 2$.

[2]

6. [P3 NSSC 2016 Q11]

The graph of $2x + y = 1$ is drawn on the grid.

(a) Write down the gradient, m , of the line $2x + y = 1$. [1]

(b) (i) Complete the table of values for $y = \frac{1}{3}x + 1$. [2]

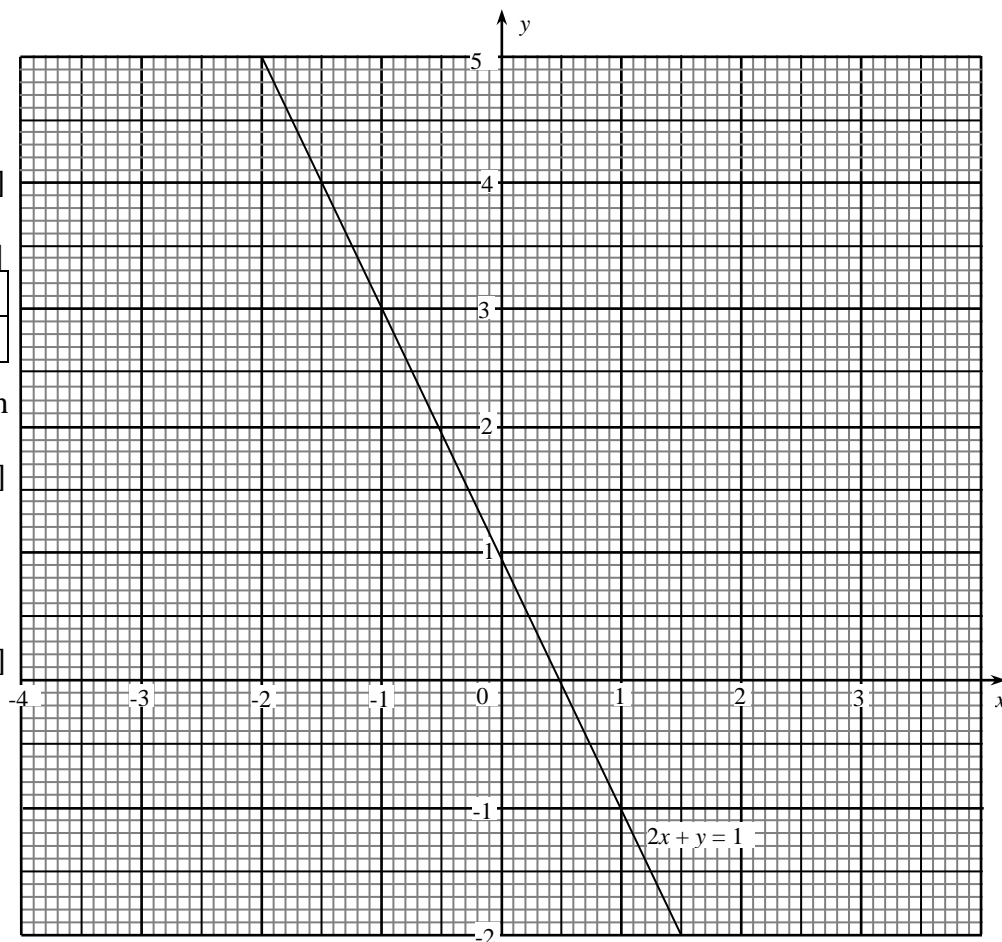
x	-3	-2	0	2	3
y		0.3	1	1.7	

(ii) On the grid, draw the graph of $y = \frac{1}{3}x + 1$ for $-3 \leq x \leq 3$. [2]

(c) Use your graph to find the solution of the simultaneous equations.

$$2x + y = 1$$

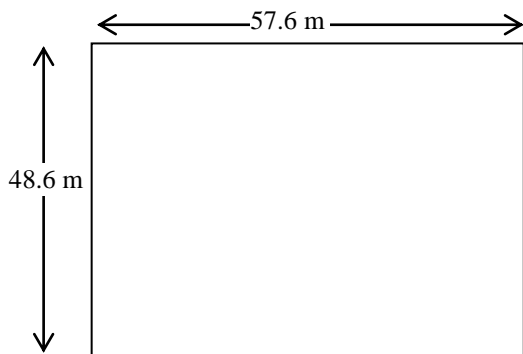
$$y = \frac{1}{3}x + 1$$



Section 12 Mensuration

1. [P1 NSSC 2010 Q 16]

A rectangular piece of land is 57.6 meters long and 48.6 meters wide.



(a) Calculate the perimeter of the piece of land. [1]

(b) How many fencing panels of width 1.8 m will be required to fence the piece of land? [2]

2. [P1 NSSC 2013 Q 3]

Diagram A shows an empty scale pan. Diagram B shows the same scale pan with fish in it.

What is the mass of the fish? Give your answer in kg.

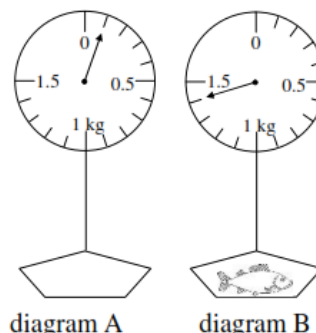


diagram A

diagram B

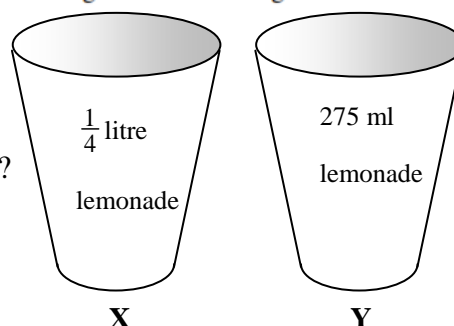
[2]

3. [P1 NSSC 2013 Q 11]

The diagram shows two cups containing different volumes of lemonade.

(a) Which cup, X or Y contains more lemonade?

(b) What is the difference between the two volumes of lemonade?



X

Y

[1]

[1]

4. [P1 NSSC 2013 Q 18]

The perimeter of the rectangle is given by $P = 2(l + b)$. In the diagram, the length of a rectangle is 5 cm and the breadth is 3 cm.



(a) Calculate the perimeter of the rectangle.

(b) Calculate the breadth, b of a rectangle if

$$P = 20 \text{ cm and } l = 8 \text{ cm.}$$

[1]

5. [P1 NSSC 2016 Q 2]

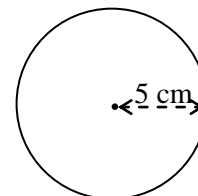
Change 3.7 kg into grams.

[1]

6. [P1 NSSC 2016 Q 22]

Calculate the area of the circle with radius 5 cm.

[2]



7. [P3 NSSC 2016 Q 7]

The diagram shows a box in the shape of a cube with sides 15 cm. A cylindrical tin fits exactly into the box as shown.

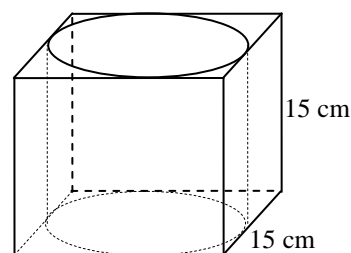
(a) Calculate the volume of the box.

(b) (i) Write down the diameter of the tin.

(ii) Write down the height of the tin.

(iii) Calculate the volume of the tin.

(c) Calculate the volume of space between the box and the tin.



[2]

[1]

[1]

[2]

[1]

Section 13 Number sets; prime numbers; factors and multiples

1. [P1 NSSC 2010 Q 2]

1 2 3 5 7 11 12

From the list of numbers above choose one that is

(a) A square number

[1]

(b) The cube root of 8

[1]

(c) Not a prime number [1]

(d) A factor of 77

[1]

(e) A multiple of 3

[1]

2. [P1 NSSC 2010 Q19] **SHOW ALL WORKING**

Without using a calculator, find the value of (a) $1\frac{1}{3} \div 2\frac{4}{5}$

[3]

(b) $\frac{13}{15} + \frac{3}{5}$ giving your answer as a mixed number.

[3]

3. [P1 NSSC 2013 Q 2]

Find the highest common factor of 21 and 35.

[1]

4. [P1 NSSC 2013 Q 14]

$\sqrt{-8}$, -3 , $-2\frac{1}{2}$, -0.532 , 1 , 2 , π , 9

From the list of numbers write down all the

(a) non-real numbers.

[1]

(b) irrational numbers

[1]

(c) negative numbers

(d) prime numbers.

[1]

5. [P3 NSSC 2014 Q 3]

(a) Find the value of

(i) 8^0 ,

[1]

(ii) the cube root of 8,

[1]

(iii) the integer closest to $(2.34)^2$

[1]

(b) Write down

(i) the highest common factor of 21 and 35.

[1]

(ii) the lowest common multiple of 9 and 15.

[1]

(c) (i) 216 can be written down as the product of two cube numbers. Write down the two numbers.

[2]

(ii) Write down **two** factors of 2007 which are both prime.

[2]

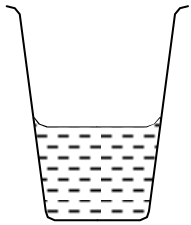
6. [P1 NSSC 2014 Q 2]
 21 23 25 27 29
 From the list of numbers above choose **one** that is (a) a square number, [1]
 (b) a prime number. [1]
7. [P3 NSSC 2015 Q 1]
 1, 4, 9, 16, 25, 36, 49, 64, 81, 100
 (a) What is the special name of the numbers listed above? [1]
 (b) From the list above write down (i) a multiple of 5, [1]
 (ii) a product of 2 and 8, [1]
 (iii) a factor of 343, **other than 1**, [1]
 (iv) a cube number [1]
 (v) two numbers with a difference of 11 [1]
8. [P1 NSSC 2015 Q 4]
 From the list of numbers to the right, write down -1 8 -3.5 9 18
 (a) a negative integer, [1]
 (b) a multiple of 4, [1]
 (c) a factor of 225. [1]
9. [P1 NSSC 2016 Q 3]
 List **all** factors of 38. [2]
10. [P3 NSSC 2016 Q1c] List all the prime factors of 24. [1]
11. [P3 NSSC 2016 Q 5] From the list of numbers, 2 4 8 15 21 24 write down
 (a) a prime number, (b) a multiple of 7, [1] [1]
 (c) a square number, (d) a factor of 75, [1] [1]
 (e) two numbers x and y such that $x = \sqrt[3]{y}$ and $y = \sqrt{64}$. [2]

Section 14 Order of numbers

1. [P1 NSSC 2010 Q 7] $\frac{5}{8}$ 6.2% 0.625 $\frac{19}{30}$ 0.62
 From the listed numbers, find
 Two equal numbers [1] (b) The smallest number [1] (c) the largest number. [1]
2. [P1 NSSC 2013 Q 15]
 Place <, = or > between the following statements to make them true.
 (a) 3^0 3 (b) 2^{-2} -4 (c) $(2^3)^2$ 64 (d) $\sqrt{5}$ 2.23 each [1]
3. [P3 NSSC 2014 Q 1(a)]
 $\frac{5}{8}$ 6.3% 0.625 0.63 $\frac{29}{40}$
 From the above list of numbers write down
 (i) two equal numbers [1]
 (ii) the largest number [1]
 (iii) 6.3×10^{-2} [1]
 (iv) The smallest number. [1]
4. [P3 NSSC 2015 Q 2]
 During one week in July the following minimum temperatures were recorded in Aus.
- | Day | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------|--------|---------|-----------|----------|--------|----------|--------|
| Temperature | -2°C | -8°C | -7°C | 0°C | 3°C | 1°C | -5°C |
- (a) List the days on which the temperature was less than -6°C. [1]
 (b) What was the lowest temperature for the week? [1]
 (c) Find the difference between the highest and the lowest minimum temperature recorded. [1]

5. [P3 NSSC 2015 Q 5]
Use one of the following symbols $>$, $<$ or $=$ to make the statement correct.
(a) $\sqrt{0.16}$ $\frac{2}{5}$ (b) 2^3 3^2 (c) $3\ 520$ 3.4×10^4 (d) 5^0 6 each [1]
6. [P1 NSSC 2016 Q 1]
Given the number 1329, rearrange the digits to get the largest possible number. [1]
7. [P1 NSSC 2016 Q9] Use $<$, $>$ or $=$ to complete the following statements.
(a) 30% $\frac{1}{4}$ [1]
(b) $\sqrt[3]{8}$ $\sqrt{4}$ [1]
(c) -3.2 -2.3 [1]
8. [P1 NSSC 2016 Q 15] Write the following numbers in ascending order (smallest first).
 2.5 , 2.46 , 2.612 \rightarrow $<$ $<$ [1]
9. [P3 NSSC 2016 Q1e] From the list $\frac{1}{9}$, 18% 0.236 write down
(i) the smallest number (ii) a number equal to $\frac{9}{50}$ [1] [1]

Section 15 Percentage and fractions

1. [P1 NSSC 2010 Q9]
The population size of Namibia was 1 409 920 in 1991 and 1 830 330 in 2001.
(a) By how much did the population increase from 1991 to 2001? [1]
(b) Calculate the percentage population increase from 1991 to 2001. [2]
2. [P3 NSSC 2013 Q1]
(a) The list shows a set of decimal numbers. 0.35 ; 0.032 ; 0.336 ; 0.3
(i) Write down the largest number. [1]
(ii) Give 0.3 as a percentage [1]
(iii) Write 0.32 as a fraction in its simplest form. [1]
(b) Find a number between 40 and 60 that is
(i) a multiple of 17, (ii) a square number, (iii) a factor of 171. [1] [1] [1]
(c) In the winter the temperature inside a house is 6°C , but outside the house the temperature is 10 degrees lower.
What is the temperature outside the house? [1]
(d) A glass, with a capacity of 270cm^3 , contains some liquid.
Estimate the volume of liquid in the glass. [check the diagram] [1]
- 
3. [P3 NSSC 2014 Q6]
In 2011 there were 2 066 398 people in Namibia.
(a) Write down this number correct to the nearest hundred. [1]
(b) 768 557 of the population of 2 066 398 were younger than 16 years.
Calculate the percentage of people who were younger than 16 years. [2]
(c) 374 171 of the people in Namibia were economically inactive
(i) How many of the people in Namibia were economically active? [1]
(ii) 52% of the economically inactive people were students. Calculate the number of students. [2]
(d) Laura is a domestic worker who received an allowance of N\$80 on weekdays and N\$120 if she worked on a Saturday.
(i) During March 2011 Laura worked 17 weekdays and 3 Saturdays.
Calculate the total allowance that she received in March. [2]
(ii) If Laura worked on a Sunday she received N\$30 per hour or part of an hour.
On a certain Sunday Laura worked from 09:24 up to 13:15. Calculate the amount she received. [2]
(e) Mr Ipinge is a pensioner who received N\$550 per month from the Government in 2011.
Of this money he used $\frac{7}{11}$ to buy food and $\frac{3}{4}$ of the remaining amount was used to pay his rent.
How much money did he have left? [2]

4. [P3 NSSC 2015 Q3]

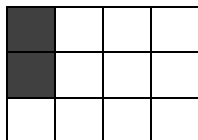
On a certain Monday, 8 out of 40 learners in a class were absent. Find

- (a) The fraction of learners who were absent, in decimal form, [1]
(b) The percentage of learners who were present. [2]

5. [P1 NSSC 2015 Q2]

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

6. Use the diagram, to write the shaded part as a fraction of the whole in its simplest form. [1]



7. [P1 NSSC 2016 Q 4]

- Write (a) $\frac{18}{25}$ as a decimal, [1]
(b) $\frac{67}{1000}$ as a percentage. [1]

8. [P1 NSSC 2016 Q 8]

(a) Miriam plants $\frac{2}{5}$ of her 80 hectares plot with potatoes.

Work out the area in hectares that she plants with potatoes. [1]

(b) What fraction of the plot is **not** used for potatoes? [1]

9. [P3 NSSC 2016 Q3]

In 2012, 72 learners in a school took Extended Mathematics. The table below shows the number of learners who scored A, B and C grades.

grade	Number of learners
A	9
B	18
C	24

(a) Express the number of learners who scored a grade B as a fraction in its simplest form. [2]

(b) Calculate the number of learners who scored below grade C. [2]

(c) $\frac{1}{9}$ of the learners are ungraded for the examination.

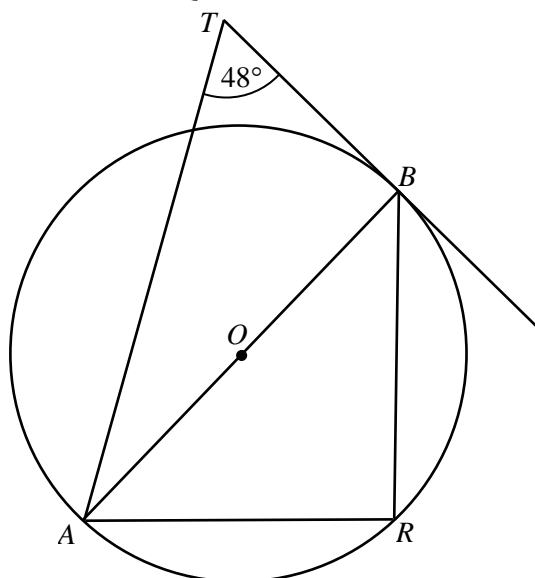
Calculate the number of learners who were ungraded. [2]

(d) Among the 72 learners who took Extended Mathematics 37.5% are boys.

Calculate the number of boys who took Extended Mathematics. [2]

Section 16 Angles in a circle: [Angle in a semi circle; angle between radius and tangent.]

1. [P3 NSSC 2010 Q8]



BT is a tangent to the circle, centre *O*. *AB* is a diameter and angle $ATB = 48^\circ$. *R* is another point on the circle.

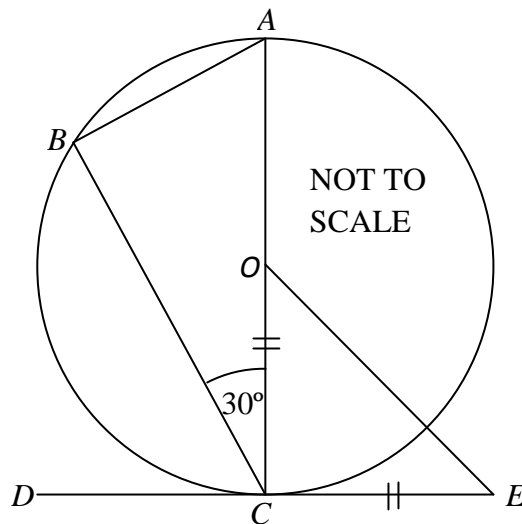
(a) Giving reasons, find the size of angle TAB [2]

(b) Write down the size of angle ARB . [1]

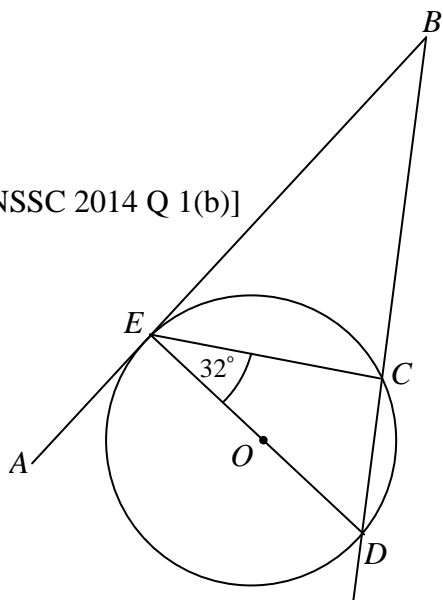
2. [P1 NSSC 2013 Q 23]

The diagram shows a circle, centre O , with diameter AC .
Angle $ACB = 30^\circ$ and $OC = CE$.

- (a) Calculate the value of
- (i) angle ABC [1]
 - (ii) angle BAC [1]
 - (iii) angle CEO [1]
- (b) Write down the special name for triangle CEO . [1]



3. [P3 NSSC 2014 Q 1(b)]



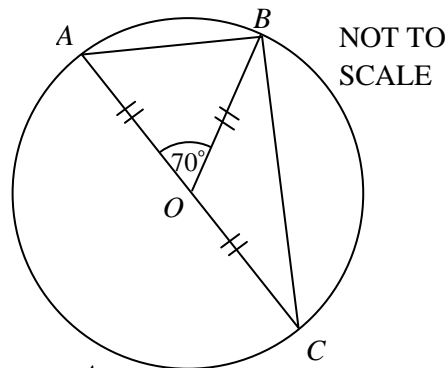
The diagram shows a circle, centre O , which passes through points C, D and E . The line AEB is a tangent to the circle at point E and the line EOD is a diameter of the circle.
Angle $DEC = 32^\circ$.

- (i) Write down the size of angle AED .
- (ii) Calculate angle CDE
- (iii) Calculate angle EBD

4. [P1 NSSC 2014 Q 17]

The diagram shows a circle, centre O , which passes through points A, B and C . In circle ABC , with centre O , angle $AOB = 70^\circ$.

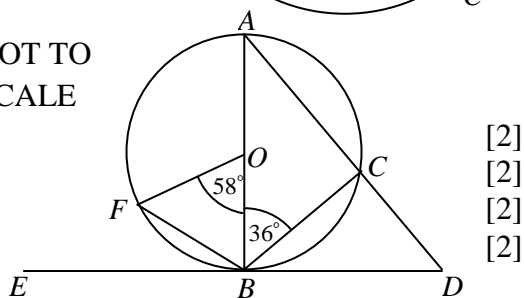
- (a) Find angle
- (i) ABC [1]
 - (ii) OAB [1]
 - (iii) OCB [1]
- (b) Write down the special name for triangle ABC . [1]



5. [P3 NSSC 2015 Q 9]

The diagram shows a circle, centre O , with a diameter of 12 cm. EBD is a tangent to the circle and angle ABC is 36° . NOT TO SCALE

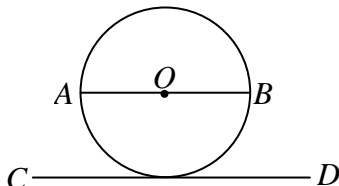
- (a) Calculate the circumference of the circle.
- (b) (i) Write down the size of angle ACB . Give reasons. [2]
(ii) Calculate the size of angle CBD . [2]
(iii) Angle FOB is 58° , find the size of angle OBF . [2]



6. [P1 NSSC 2016 Q 23]

Give the geometrical name of line

- (a) AB ,
- (b) CD .



- [1]
- [1]

Section 17 Probability.

1. [P1 NSSC 2010 Q 21]

A bag contains 8 red, 5 green beads and 3 blue beads. Helena picks a bead at random.

- What is the probability that it is
- (a) green [1]
 - (b) not green [1]
 - (c) yellow [1]

2. [P1 NSSC 2014 Q15]

There are 20 girls and 15 boys in a class of 35. The distribution is shown in the table at the right side of this page.

Find the probability that, if a learner is selected at random from the class, the learner will be

- (a) a boy,
- (b) 17 years old,
- (c) older than 17 years,
- (d) 15 years old.

Age	Total
16	2
17	28
18	4
19	1

3. [P1 NSSC 2015 Q22]

Use the words *certain*, *unlikely* and *impossible* to describe the probability of

- (a) a rainstorm in Oshakati on 25 June, [1]
- (b) being born on 31 April, [1]
- (c) the sun will rise tomorrow. [1]

4. [P1 NSSC 2016 Q 10]

Each letter of the word USAKOS is written on a separate card. A card is picked at random.

Find the probability that the letter on the card is (a) K, (b) S, (c) G each [1]

Section 18 Proportion & rate

1. [P1 NSSC 2013 Q8]

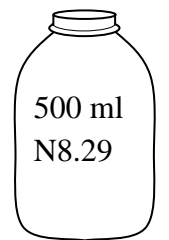
15 chicken rolls are needed for a party. Each chicken roll contains 70 grams of minced chicken. How much minced chicken will be needed? Write your answer in kilograms. [2]

2. [P3 NSSC 2015 Q6]

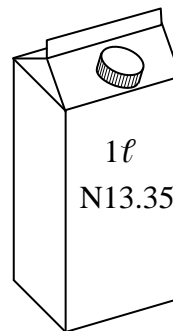
A supermarket sells milk in four different sized containers.

- (a) Convert 500 ml to litres
- (b) Complete the table below to find the cost per litre of milk in each container.

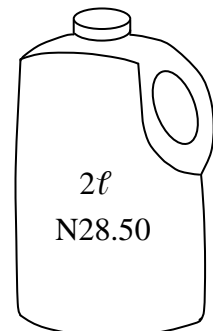
Container	Cost per litre
A	N\$
B	N\$13.35
C	N\$



Container A



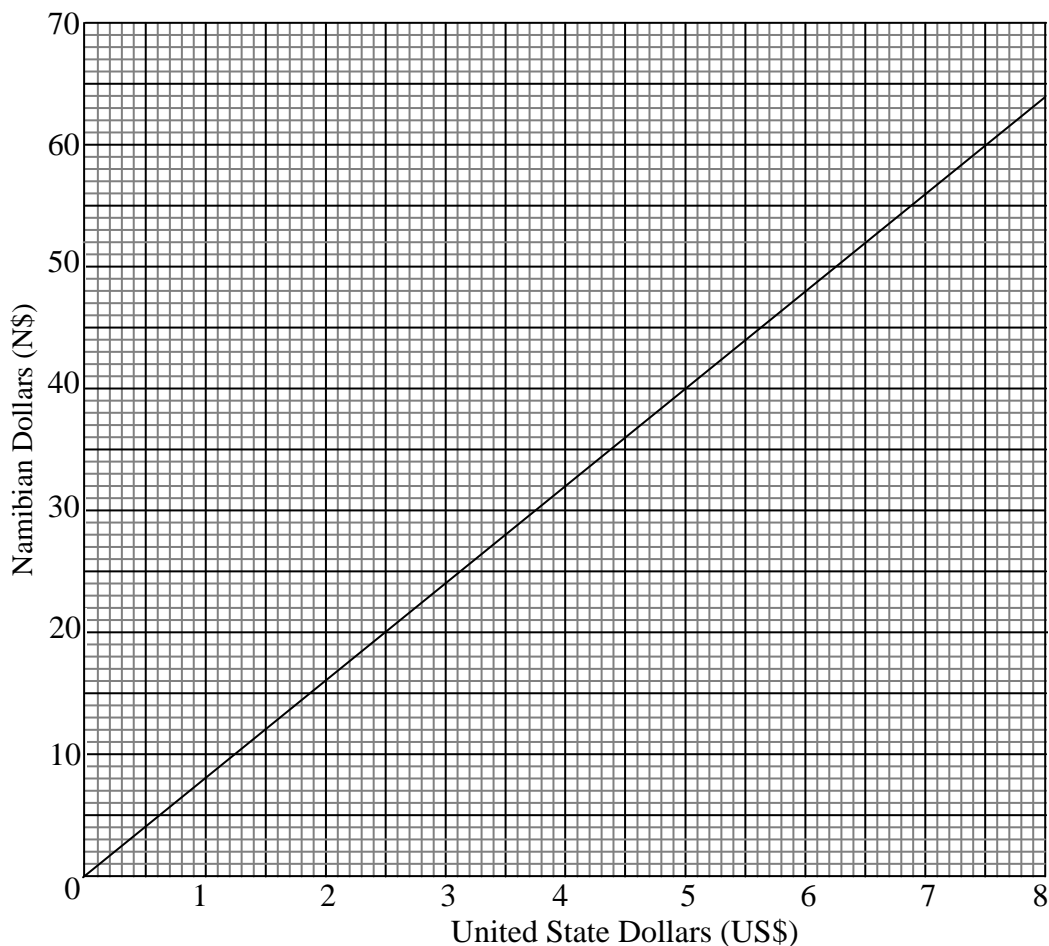
Container B



Container C

- (c) Which size of container is the best value for money? [1]

3. [P1 NSSC 2015 Q15]



The graph to the left is used to convert Namibian dollars to US dollars. Use the graph to find

(a) the value of US\$5 in N\$ [1]

(b) the value of N\$ 46 in US dollars. [1]

4. [P3 NSSC 2016 Q 4]

A certain truck only covers a distance of 630 km on a full tank of 70 litres of petrol.

(a) Calculate how far the truck can travel with 1litre of petrol. [2]

(b) The price of 1 litre of petrol is N\$ 11.56. Calculate the cost that will fill up the tank of the truck. [2]

(c) The truck covers a distance of 630 km in 6 hours. Calculate its average speed. [2]

(d) The truck started the journey at 06:45. The truck drove 2 hours 30 minutes at a constant speed before it stopped. At what time did it stop? [2]

Section 19 Ratio

1. [P3 NSSC 2010 Q10(c)]

On a map with a scale of 1 : 50 000 the distance from Gobabis to local airfield is 10cm.

Find the real distance to the airfield. [2]

2. [P1 NSSC 2013 Q4]

In a school of 1040 learners, the ratio of boys to girls is 2 : 3. Calculate the number of girls. [2]

3. [P1 NSSC 2014 Q3]

(a) An irrigation project near Rundu harvested onions, wheat and pumpkins in the ratio 25 hectares : 50 hectares : 5 hectares. Write down the ratio 25 : 50 : 5 in its simplest form. [1]

(b) The project also supplied a fresh vegetable and fruit outlet in Windhoek with 11 000 ten kilogram bags of butternuts. How much is that in tonnes? [1]

4. [P3 NSSC 2015 Q4]

The scale of a map is 1 : 2 500 000.

(a) Find the real distance (in **km**), if the distance on the map is 4.5 cm. [2]

(b) Work out the distance on the map (in **cm**), if the real distance between two towns is 250 km. [2]

5. [P3 NSSC 2015 Q8]

John, Paul and Tim are three brothers aged 14, 16 and 18 respectively. Their parents gave them N\$816 to divide in the ratio of their ages.

- (a) Give the ratio of their ages in their simplest form. [2]
 (b) Calculate the amount of money that Paul will receive. [2]
 (c) Tim received N\$306
 (i) Write down his share as a common fraction of the total amount. Give the answer in its simplest form. [2]
 (ii) Tim spends $\frac{7}{10}$ of his money. Find the amount he has left. [2]

6. [P1 NSSC 2015 Q 9]

Anja and Ruan share a box of 35 chocolate bars in the ratio Anja : Ruan = 1 : 4.
 Calculate the number of chocolate bars Ruan received. [2]

7. [P1 NSSC 2016 Q 14] Chantal and Joseph share 60 sweets in the ratio of their ages .
 Chantal is 15 years old and Joseph is 30 years old.

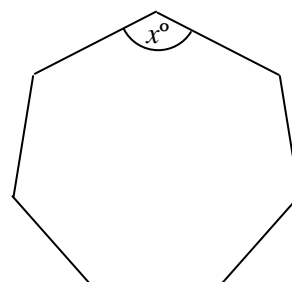
- (a) Write down the ratio of their ages, Chantal : Joseph in its simplest form. [1]
 (b) Calculate the amount of sweets that Joseph will get. [2]

Section 20 Regular polygons

1. The diagram shows a regular seven-sided polygon.

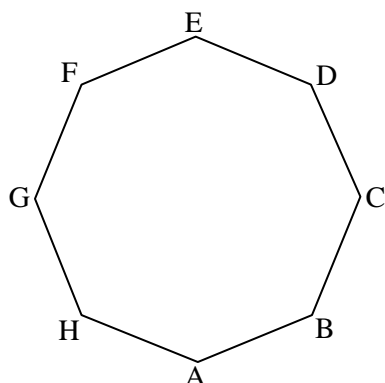
Each of the interior angles measures x° .
 One of the angles is marked in the diagram.
 Calculate the value of x , giving your answer correct to 1 decimal place.

Show all your working.



2. A nonagon is a polygon with nine sides.

Calculate the size of an interior angle of a **regular** nonagon.



NOT TO SCALE

ABCDEFGH is a regular octagon.

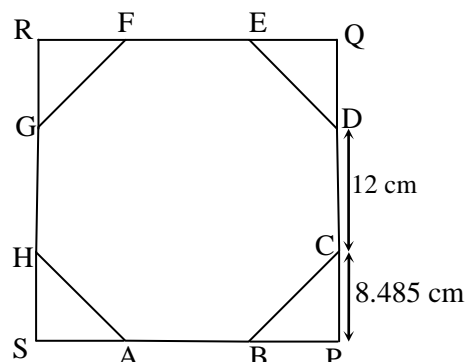
- (a) Show that angle BCD = 135°
 (b) Find angle DEB
 (c) Find angle FEB.

3.

The sides of the octagon are extended to form square PQRS.

The length of each side of the octagon is 12 cm and the length of CP is 8.485 cm.

- (d) Calculate the area of triangle BPC.
 (e) Calculate the area of octagon ABCDEFGH.



4. [P1 NSSC 2013 Q21 (c)]

Calculate the size of the exterior angle of a regular octagon.

5. [P3 NSSC 2015 Q10]

The sum, S , of the angles of an n -sided polygon is given by the formula $S = 180n - 360$.

- (a) Use the formula to find the sum of the angles of a seven-sided polygon. [2]
 (b) If the sum of the angles of a polygon is 1620° , find the number of its sides. [2]
 (c) Use the formula to make n subject. Show your working. [2]
 (d) Factorise $180n - 360$ completely. [1]

Section 21 Sequences and patterns

1. [P3 NSSC 2010 Q7(a)]

Given the sequence 1, 7, 13, 19.....

(a) Find the next term,

[1]

(b) Find the tenth term.

[1]

2. [P3 NSSC 2010 Q7(b)]

The n^{th} term of another sequence is $6n + 3$.

Write down the first three terms of this sequence.

[2]

3. [P3 NSSC 2010 Q7(c)]

Find the n^{th} term of the sequence 1, 13, 25, 37,....

[2]

4. [P3 NSSC 2013 Q8]

The pattern on the diagrams forms a sequence.

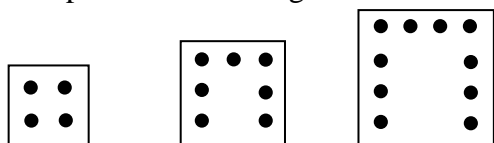


Diagram 1

Diagram 2

Diagram 3

Diagram 4

Diagram 5

(a) Add two more diagrams (diagram 4 and 5) to the sequence.

[2]

(b) Complete the table

Diagram	1	2	3	4	5
Number of dots.	4	7	10		

[2]

(c) Find the number of dots in the 12th diagram.

[1]

(d) Write down a rule to find the number of dots in the n^{th} diagram.

[2]

5. [P1 NSSC 2014 Q14]

The first five terms of a number sequence are 2, 5, 8, 11, 14

(a) Write down the next **two** terms of the sequence.

[1]

(b) Write down the 10th term of the sequence.

[1]

(c) Find the n^{th} term of the sequence in its simplest form.

[1]

6. [P1 NSSC 2015 Q16] Look at the sequence 3, 9, 15, 21,.....

(a) Write down the next term of the sequence.

[1]

(b) Find the n^{th} term of the sequence.

[2]

7. [P3 NSSC 2016 Q 9]

The terms 4, 7, 10, ... form part of a sequence.

(a) Write down the next 2 terms of the sequence.

[2]

(b) Find the n^{th} term.

[2]

(c) Find the 100th term.

[1]

(d) Which term of the sequence will be equal to 151?

[2]

Section 22 Statistics I: measures of central tendency → mean; mode and median .

1. [P3 NSSC 2010 Q12]

A teacher did a survey to find out how many meals each of her 108 students have eaten in the previous day.

The results are shown in the table.

meals per day	1	2	3	4	5
frequency	2	13	40	45	8

(a) Write down the mode

[1]

(b) Write down the median

[1]

(c) Calculate the mean.

[3]

(d) Calculate the mean of this distribution

[3]

(e) Find down the mode

[1]

(f) Calculate the median.

[1]

2. [P1 NSSC 2015 Q23]

The Eastern rugby team scored the following points in its first five games: 15 19 7 19 3

Using these points find the

(a) mode,

[1]

(b) median

[1]

3. [P1 NSSC 2016 Q11]

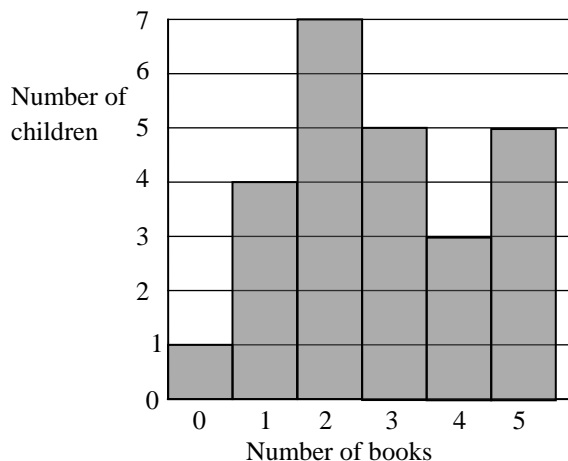
The following temperatures in °C were recorded for a week. 17, 23, 7, 12, 13, 18, 8

Calculate the mean temperature.

[2]

Section 23 Statistics II: frequency

1. [P1 NSSC 2010 Q3]



A group of children were asked how many books they had each to read last month. The results of the survey are shown in the bar chart.

Find

(a) The modal number of books

[1]

(b) The number of children in the group

[1]

(c) The proportion of children who read more than 3 books, giving your answer as a fraction.

[2]

2. (a) [P3 NSSC 2013 Q6]

A normal die is thrown 60 times.

The results are shown in the table.



1	2	5	3	2	6	5	2	6	4
2	3	4	5	6	2	3	1	1	2
2	1	2	6	1	3	5	6	2	4
6	3	5	4	2	6	1	4	6	5
4	2	6	5	2	1	3	4	5	1
5	6	1	2	5	6	2	3	4	6

(i) use these results to complete the frequency table below.

[3]

Number	1	2	3	4	5	6
Frequency	9		7		10	

(ii) Write down the mode

(iii) Calculate the mean.

[1]

[3]

(b) Sushmita throws another die.

The bar chart shows her results.

(i) How many times did Sushmita throw the die?

(ii) How many times did the number 4 occur?

(iii) Which number occurred the least number of times?

[2]

[1]

[1]

(c) When you throw an ordinary die once, what is the probability of

(i) showing a two?

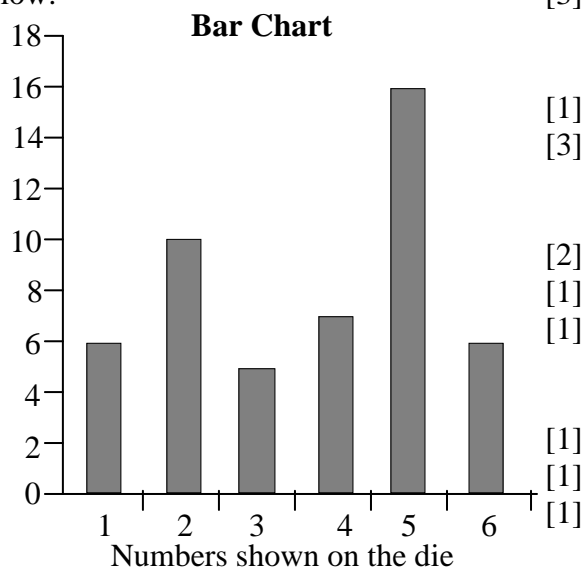
(ii) showing an odd number?

(iii) not showing a 3?

[1]

[1]

[1]



3. [P3 NSSC 2014 Q5]

Fifty people are asked how many times they had visited the Etosha Game Park. The table shows the results.

Number of visits	0	1	2	3	4	5	6	7
Number of students	4	7	8	7	10	6	5	3

- (a) How many people had 6 visits? [1]
- (b) How many people had less than 5 visits? [1]
- (c) Find (i) the modal number of visits, [1]
- (ii) the median number of visits, [1]
- (iii) the mean number of visits. [2]
- (d) A bar chart is drawn to show the results. The height of the bar representing the number of people who had 0 visits is 2 cm. What is the height of the bar for the number of people who had 5 visits? [1]
- (e) A pie chart is drawn to show the results. What is the angle for the number of people who had 6 visits? [2]
- (f) Work out the percentage of people who had **less than** 4 visits. [2]
- (g) A person is chosen at random from the fifty people. What is the probability that this person had
- (i) exactly 5 visits, [1]
- (ii) at least 5 visits, [1]
- (iii) more than 7 visits? [1]

4. [P1 NSSC 2014 Q12]

This table shows the minimum and maximum temperatures in different cities of the world on the same day.

Place	Minimum (°C)	Maximum(°C)
Windhoek	19	33
New York	-3	8
Moscow	-14	-3

- (a) What was the highest temperature recorded? [1]
- (b) In which city was the lowest temperature recorded? [1]
- (c) Calculate the biggest difference between the minimum and the maximum temp. recorded in a city? [1]

5. [P3 NSSC 2015 Q12]

Over a period of two weeks, Gretha records the number of elephants seen each day at a water hole in Etosha pan.

The results are as follows: 7, 3, 0, 4, 9, 1, 3, 12, 6, 5, 14, 3, 1, 2

- (a) Calculate the mean number of elephants. [3]
- (b) Write down the modal number of elephants. [1]
- (c) Find the median number of elephants. [2]
- (d) Complete the frequency table below: [2]

Number of elephants	0 – 3	4 – 7	8 – 11	12 – 15
frequency				

- (e) Find the probability that Gretha records
- (i) eight or more elephants, [1]
- (ii) less than four elephants, [1]
- (iii) twenty elephants in these two weeks. [1]
- (f) Estimate the number of days in the next eight weeks that Gretha can expect to record 4 – 7 Elephants. [2]

6. [P1 NSSC 2016 Q 27]

In a class of 25, learners are asked what kind of a drink they prefer.

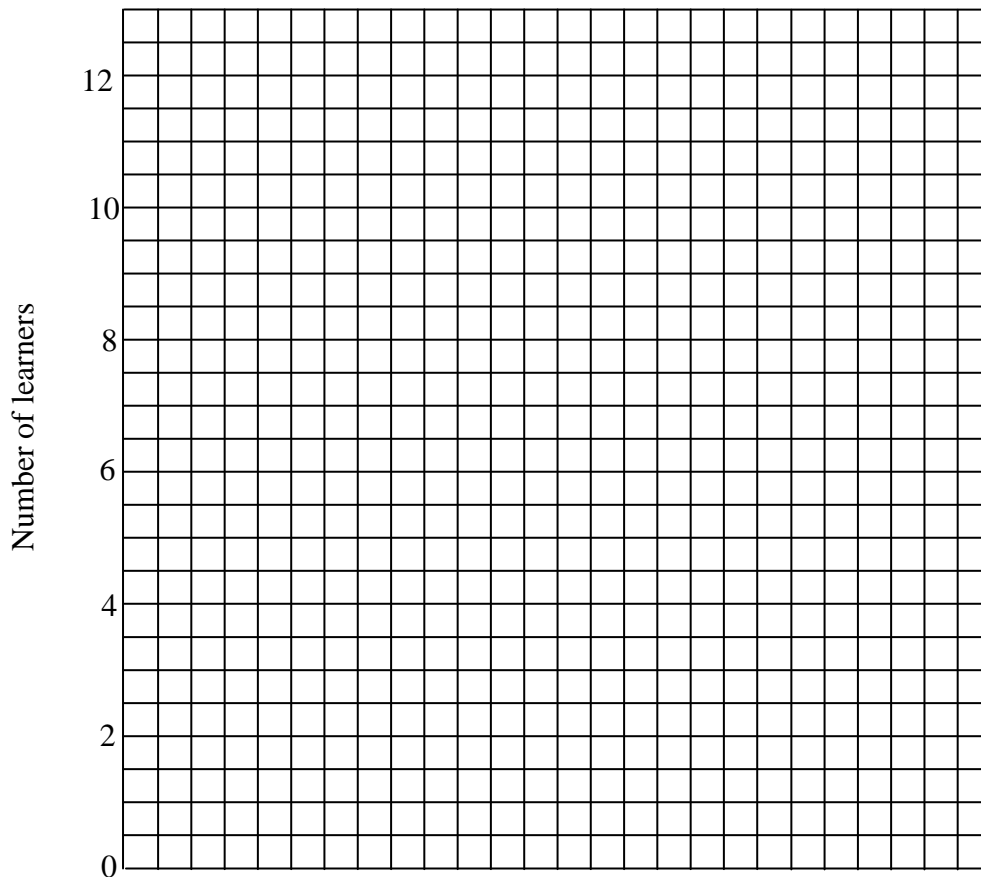
The table shows the results.

Types of drink	milkshake	Drinking yoghurt	milk	Fruit smoothie
Number of learners	11	6	3	

(a) Complete the table to show how many learners prefer fruit smoothies.

[1]

(b) Draw a chart to represent information in the table



[3]

Types of drinks

Section 24 Statistics III: pie charts

1. [P3 NSSC 2013 Q4]

A teacher did a survey to find out what each of her 108 students had for lunch. The results are shown in the table.

Type of lunch	Number of students	Angle in the pie chart.
Hot meal	15	50°
Sandwiches	42
Quick snack	24	80°
No lunch	27
Total	108	360°

Calculate the missing values in the table, which indicate the angles for each part in the pie chart.

[3]

2. [P1 NSSC 2013 Q 19]

The pie chart, which is drawn accurately, shows the nationalities of people staying in a holiday hotel.

(a) Which of these nationalities had the smallest number of people in the hotel?

[1]

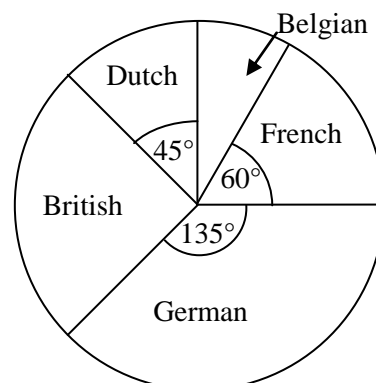
(b) (i) What fraction of the people in the hotel were French?

[1]

Give the answer in its simplest form.

[1]

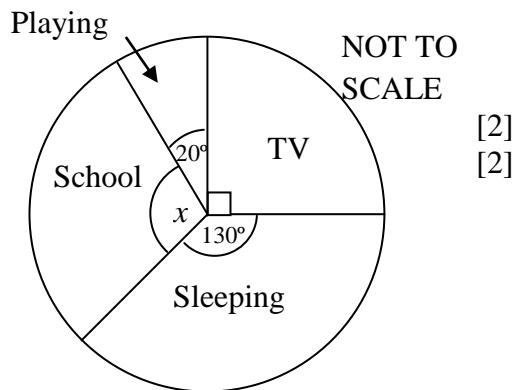
(ii) Write the answer to (b) (i) as a percentage.



3. [P1 NSSC 2015 Q 24]

The pie chart shows how Thomas spent 24 hours of one day.

- (a) Calculate the value of angle x
 (b) Calculate the number of hours Thomas spent watching TV.



4. [P3 NSSC 2016 Q 12]

A survey was carried out at a school to find out the shoe size of learners in a grade 12 class.

There are 36 learners in the class. Their shoe size are shown in the table below.

6	6	4	7	7	7	5	5	7	6	5	7	8	5	6	6	7	6
9	7	5	7	6	9	5	6	7	7	5	5	8	5	6	7	6	4

- (a) Use the data to complete the frequency table to the right.

Number	4	5	6	7	8	9
Frequency		9		11		

- (b) Find (i) the mode (ii) the median (iii) the mean. [1] [2] [3]
 (c) The table shows the shoe size of the boys in another Grade 12 class.

This information can be represented on a pie chart.

- (i) Complete the table by finding the missing angles. [2]

shoe size	number of boys	angle on a pie chart
6	2	36°
7	9	
8	5	90°
9	3	
10	1	18°
Total	20	360°

- (ii) If a boy is chosen at random, what is the probability that he wears size 6? [1]
 (iii) If a boy is chosen at random, what is the probability that he does **not** wear a size 9? [2]
 (iv) Calculate the percentage of the boys that wear a size 10. [2]

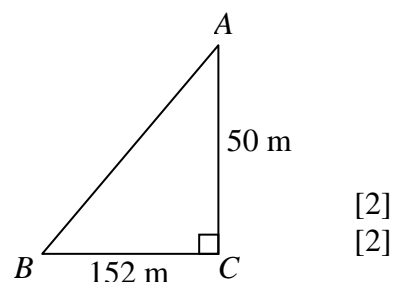
Section 25 Trigonometry; Pythagoras; angles and bearings

1. [P1 NSSC 2010 Q 15]

A boat B is 152 m from shore at C .

A cliff AC is 50 m high.

- (a) Calculate the angle of elevation from the boat to top of the clip at A .
 (b) Calculate the distance AB .

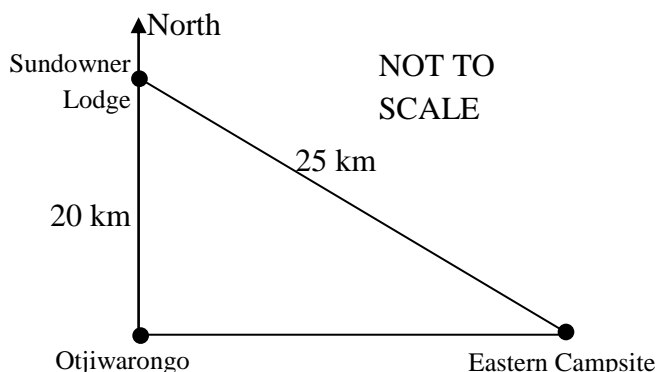


2. [P1 NSSC 2013 Q 17]

Astrid stands on a bearing of 036° from Brendon.

Calculate the bearing of Brandon from Astrid. [1]

3. [P1 NSSC 2013 Q 22]



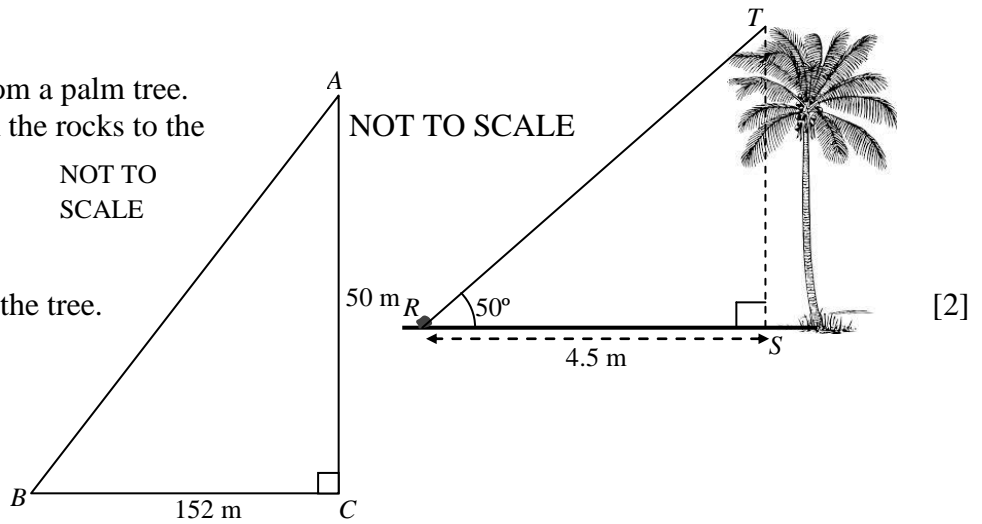
In the diagram, the Sundowner lodge is 20 km due north of Otjiwarongo and the distance between the Eastern Campsite and the Sundowner lodge is 25 km.

Calculate the distance between Otjiwarongo and the Eastern Campsite. [2]

4. [P1 NSSC 2013 Q 24]

A rock, R , is 4.5 m away from a palm tree.
The angle of elevation from the rocks to the

top of the tree is 50° .
Calculate the height, TS , of the tree.

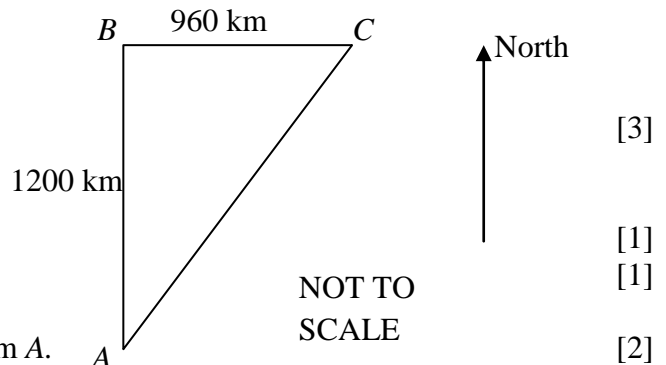


[2]

5. [P3 NSSC 2013 Q 12]

The sketch shows the positions of three airports.
 A is 1200 km south of B and C is 960 km east of B .

- (a) Using a scale of 1 cm to represent 200 km, draw triangle ABC accurately.
(b) Measure the distance AC in (a) and give the distance in
(i) centimetres,
(ii) kilometres.
(c) Use your protractor to measure angle BAC in your drawing and find the three figure bearing of C from A .



[3]

[1]

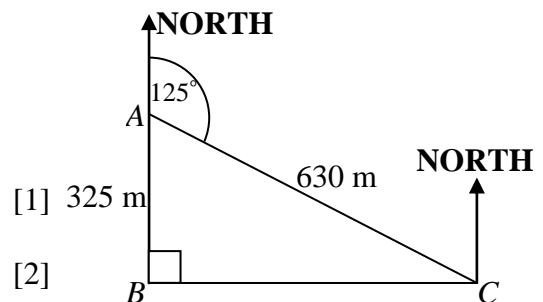
[1]

[2]

6. [P1 NSSC 2014 Q 19]

Charlton (C) is on a bearing of 125° from Alyssa (A).
Alyssa (A) is 325 m due north of Brandon (B).
The distance between Alyssa (A) and Charlton (C) is 630 m.

- (a) Calculate the bearing of Alyssa (A) from Charlton (C)
(b) Calculate the distance between Brandon and Charlton (the length of the line BC)

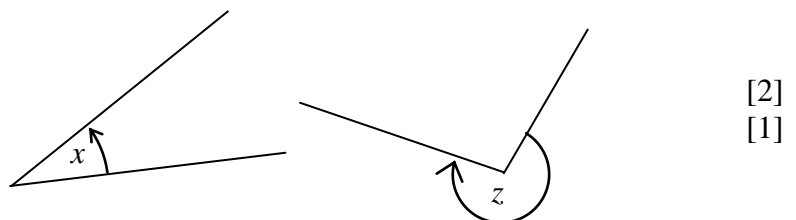


[1]

[2]

7. [P1 NSSC 2015 Q 17]

- (a) Name the type of angle x and z .
(b) Measure and give the value of angle x .



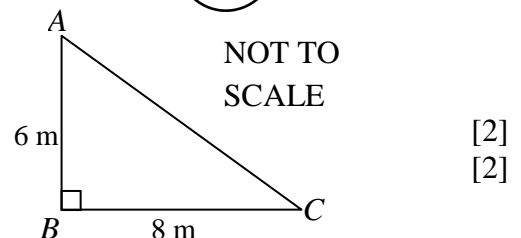
[2]

[1]

8. [P1 NSSC 2015 Q 19]

The diagram shows triangle ABC , such that $AB = 6$ m,
 $BC = 8$ m and angle B is a right angle.

- (a) Calculate the length of AC .
(b) Calculate the size of angle ACB .

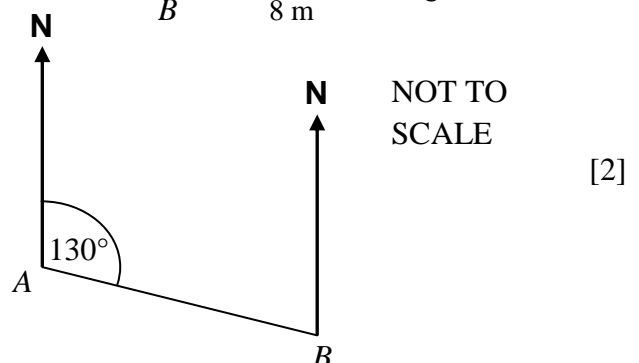


[2]

[2]

9. [P1 NSSC 2016 Q17]

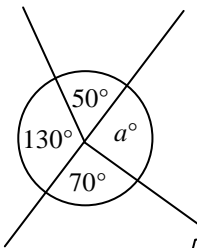
The diagram shows point A and B .
Calculate the bearing of point A from B .



[2]

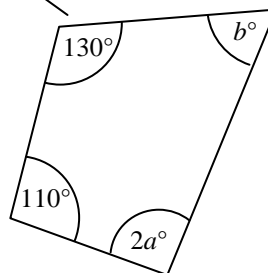
10. [P3 NSSC 2016 Q 10]

(a) Calculate the value of angle a° .



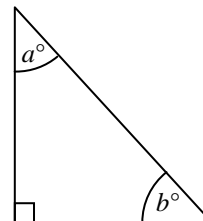
[2]

(b) The diagram shows a quadrilateral. By writing down an equation in terms of a and b , show that it simplifies to $2a + b = 120$.



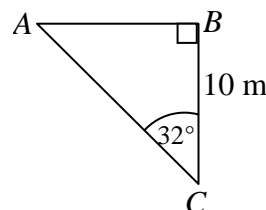
[2]

(c) In the triangle drawn to the right $a + b = 90^\circ$. Give reasons.



[1]

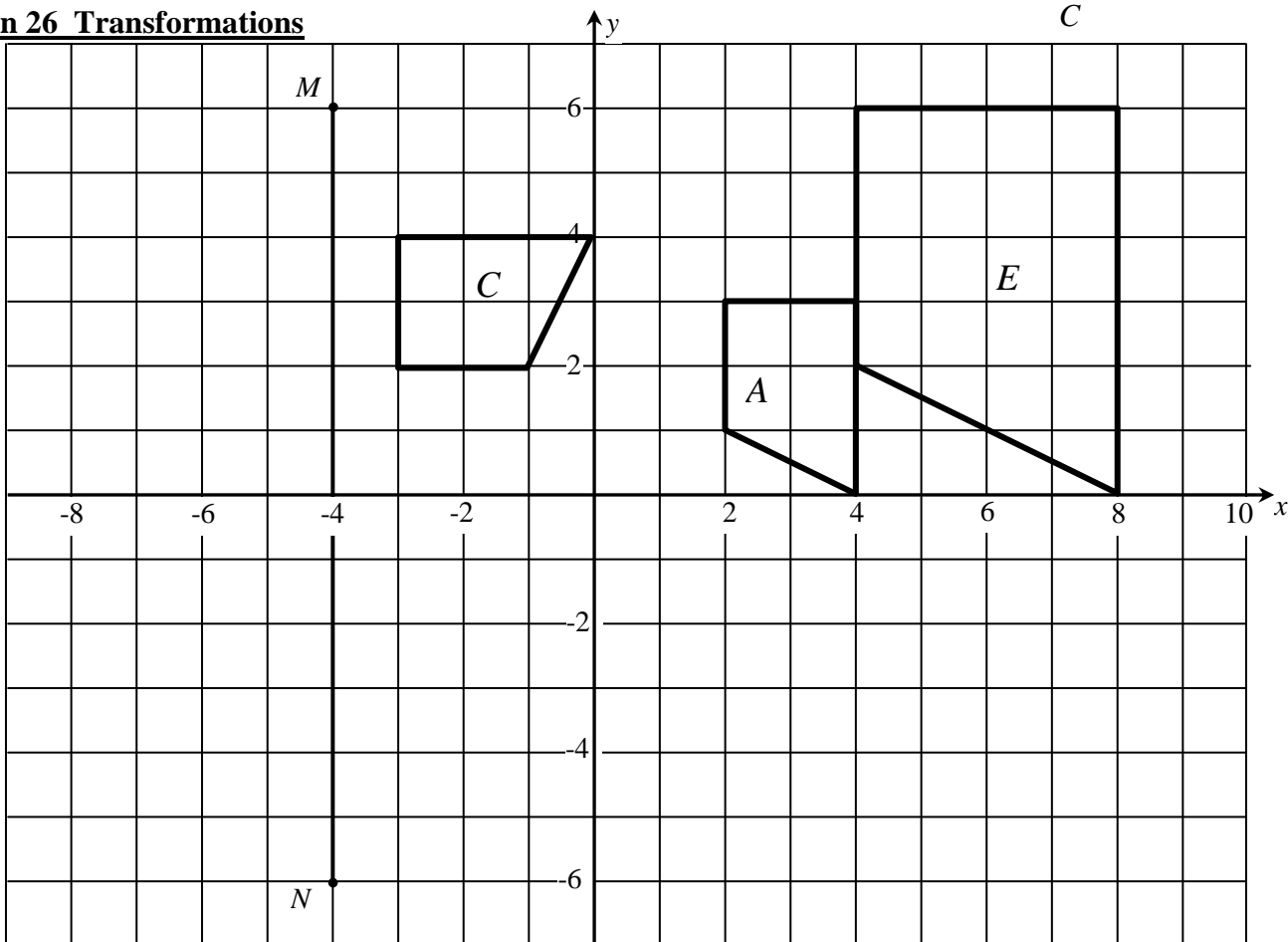
(d) Using triangle ABC , drawn to the right, calculate the length of AC .



[3]

Section 26 Transformations

1.



(a) Reflect figure A in the x -axis, label the image B .

(b) Translate A by the vector $\begin{pmatrix} 4 \\ -4 \end{pmatrix}$, label the image D .

(c) Figure A was mapped onto figure E by an enlargement.

(i) Find the scale factor.

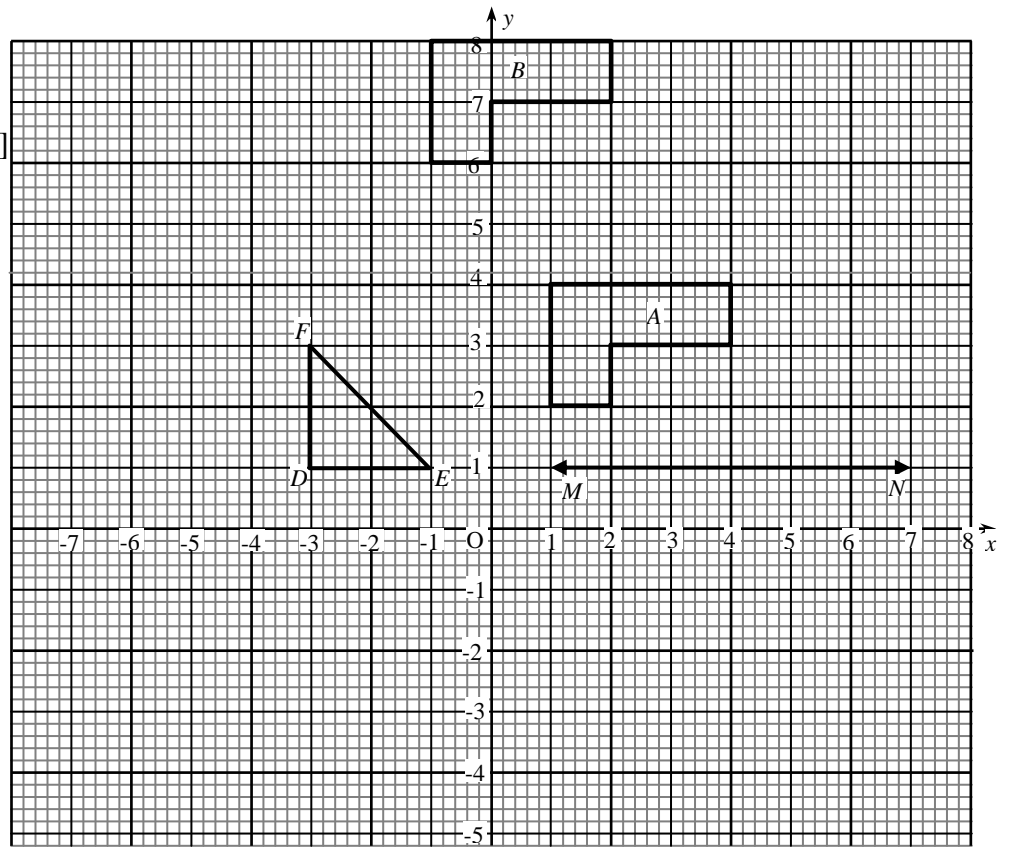
(ii) Find the coordinates of the centre of enlargement.

(d) Reflect figure C in the line MN , label the image F .

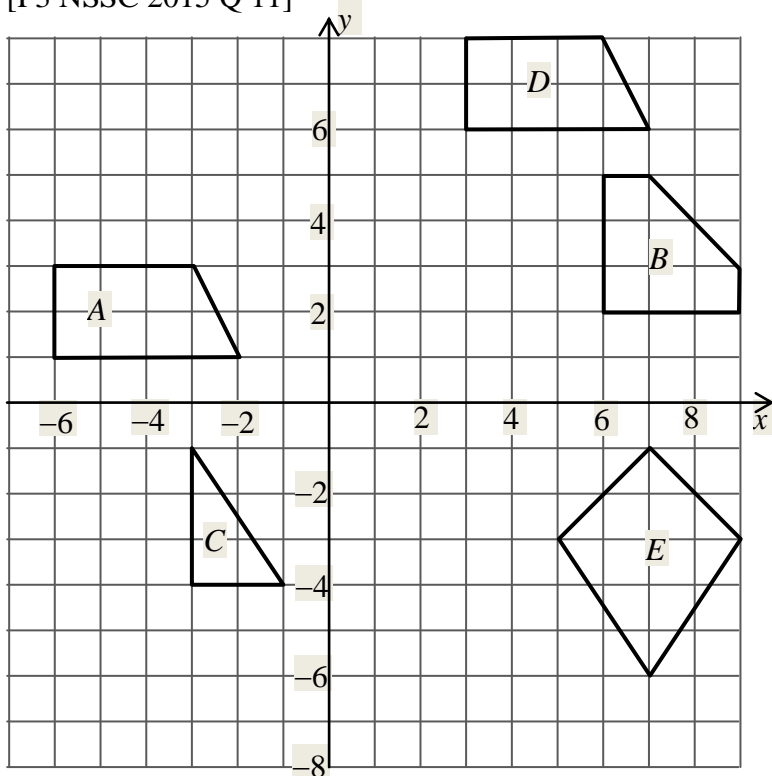
(e) Describe fully the single transformation that maps figure A onto figure C .

2. [P3 NSSC 2013 Q 10]

- (a) Describe the transformation that maps figure *A* onto *B*. [3]
 (b) Draw the reflection of figure *A* in the line *MN* and label it *C*. [2]
 (c) Draw the enlargement of triangle *DEF* with $(0, 0)$ as centre of enlargement and scale factor 2. Label it $D_1E_1F_1$. [2]

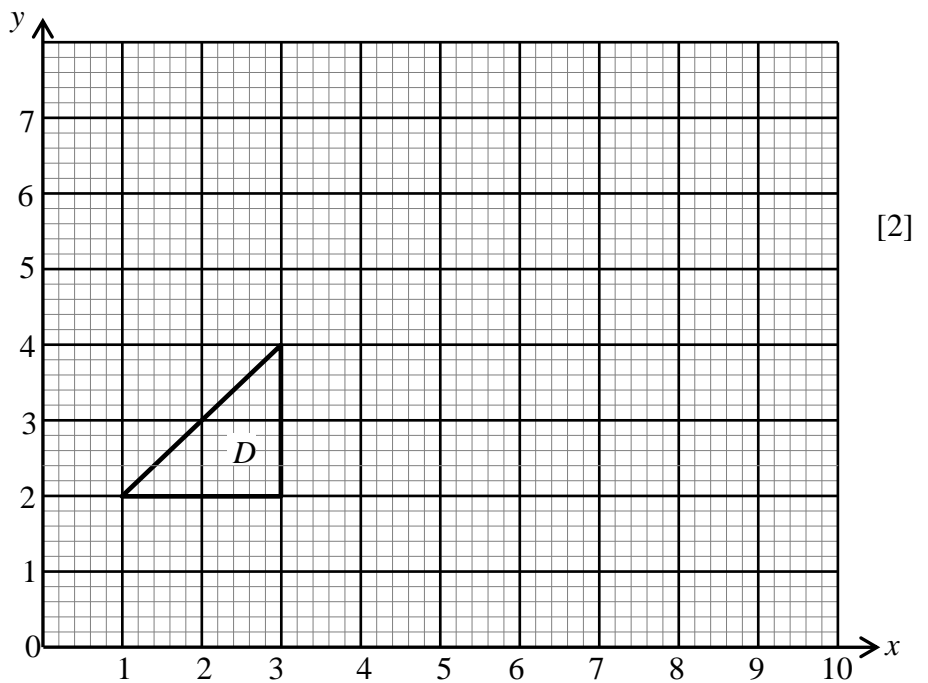


3. [P3 NSSC 2015 Q 11]



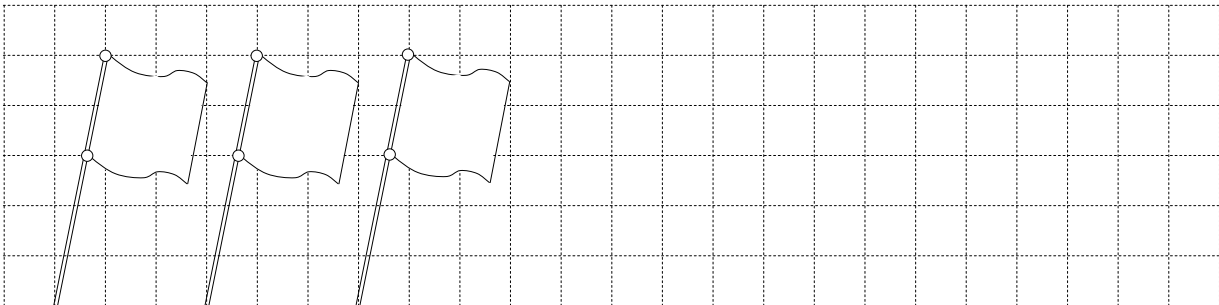
- (a) Describe fully the single transformation that maps figure *A* onto *D*. [2]
 (b) On the grid to the left, draw the reflection of figure *C* in the *y*-axis. [2]
 (c) Draw the line of symmetry of figure *B*. [1]
 (d) Give the mathematical name for quadrilateral *E*. [1]

4. [P1 NSSC 2016 Q 24]
 In the grid triangle D is shown.
 Enlarge triangle D with centre of enlargement $(1, 2)$ and scale factor 2.
 Label the triangle E .



[2]

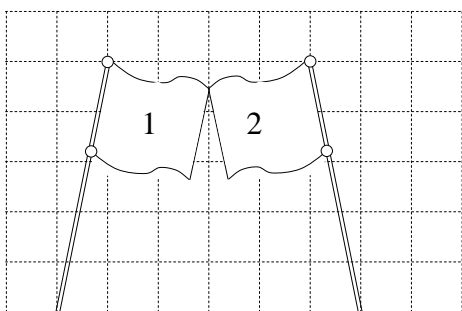
5. [P3 NSSC 2016 Q 6]



- (a) Draw two more flags to continue the pattern in the diagram above.

[2]

- (b)



Describe fully the single transformation which maps 1 onto 2. Draw on the diagram any other information which can help you describe this transformation.

- (c)

[2] [2]



Describe fully the single transformation which maps 3 onto 4. Draw on the diagram any other information which can help you describe this transformation.