DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department for Curriculum Management and eLearning
Educational Assessment Unit
Annual Examinations for Secondary Schools 2011

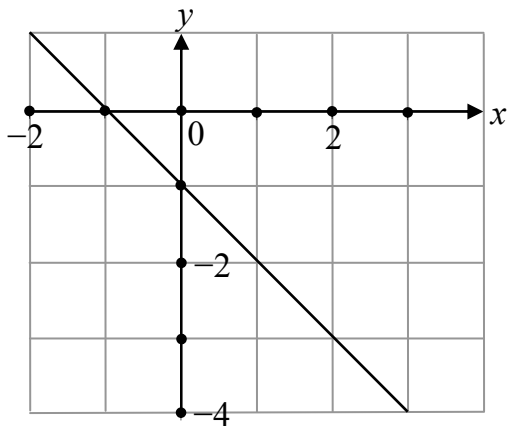
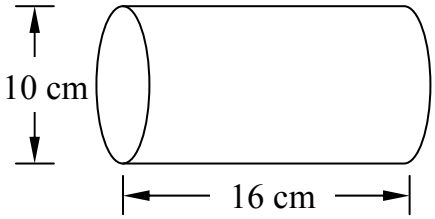
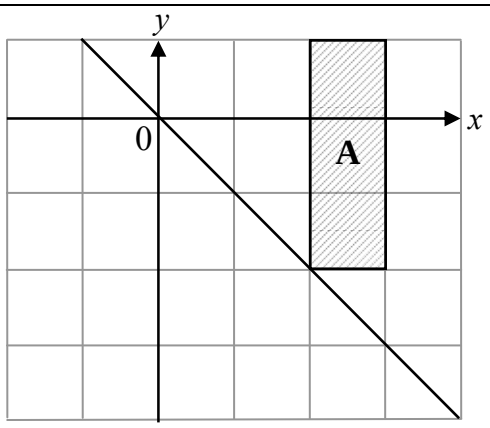
FORM 4 **MATHEMATICS SCHEME B** **TIME: 20 minutes**
(Non Calculator Paper)

Name: _____ **Class: _____**

Mark

Instructions to Candidates

- **Answer all questions.**
- **This paper carries a total of 20 marks.**
- **Calculators and protractors are NOT ALLOWED.**

No.	QUESTION	Spa... Work... Requi...
1.	Consider the following data: 1 , 7 , 8 , 8 , 12 , 16 , 17 , 19 , 20 Which one of the following statements is **not true**? (A) Median = 12 (B) Mode = 8 (C) Range = 19 (D) Mean = 11 Ans:_____	
2.	Use this graph to find the value of x when $y = -4$.  Ans:_____	
3.	 DIAGRAM NOT TO SCALE Which expression gives the **volume** of the cylinder? (A) $\pi \times 5^2 \times 16$ (B) $\pi \times 8^2 \times 5$ (C) $\pi \times 10^2 \times 16$ (D) $\pi \times 8^2 \times 10$ Ans:_____	
4.	Draw the reflection of shape A in the line $y = -x$. 	

5. Write as a single number in index form: $23^5 \div 23^6$

Ans:_____

6. The area of the unshaded sector is 350 cm^2. Calculate the area of the **shaded** sector.

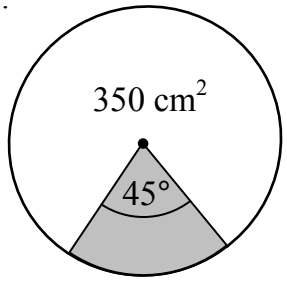


DIAGRAM NOT TO SCALE

Ans: _____cm^2

7. Which one of the following statements is correct?

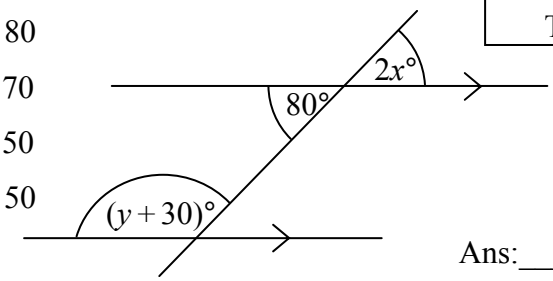
(A) $x = 40,\ y = 80$

(B) $x = 40,\ y = 70$

(C) $x = 80,\ y = 50$

(D) $x = 40,\ y = 50$

DIAGRAM NOT TO SCALE



Ans:_____

8. Expand: $5(9 + 4x)$

Ans:_____

9. A red light flashes every 8 seconds and a green light flashes every 6 seconds. Kyle sees the red and green lights flash at the same time. After how many seconds will he next see them flash together again?

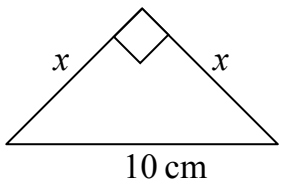
Ans:_____

10. Work out: $7\frac{3}{5} - 2\frac{1}{2}$

Ans:_____

11. Which one of the following is the best approximation for x?

(A) 5 cm
(B) 7 cm
(C) 9 cm
(D) 10 cm



Ans:_____

12. If $A \times \frac{1}{9} = 1$, what is the value of A?

Ans:_____

13. Write $4{\cdot}06 \times 10^3$ as an ordinary number.

Ans:_____

14. How many square centimetres are there in 1 m^2?

Ans:_____ cm^2

15. Manuela has a music collection of 600 songs. The songs are stored on her computer, MP3 player and CDs in the ratio 2 : 3 : 5. How many songs are stored on her MP3 player?

Ans:_____

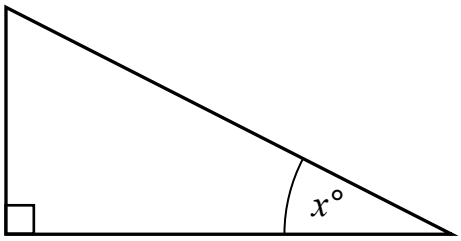
16. A map scale is 1 : 100 000. What **real length**, in **km**, is represented by a length of 4 cm on the map?

Ans:_____km

17. What is the sum of the **interior** angles of an octagon? °

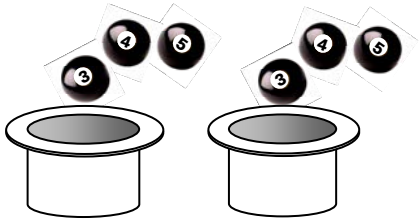
Ans:_____

18. Use your ruler to take the necessary measurements to find the value of $\tan x°$. Give your answer as a fraction.



Ans:_____

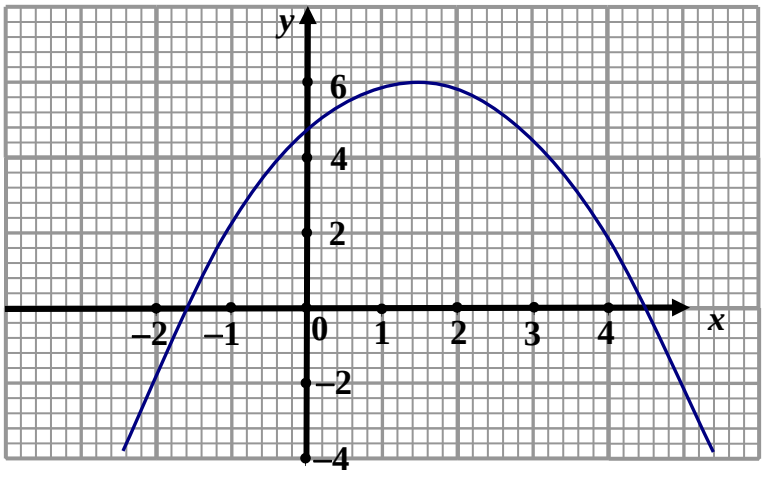
19. Three billiard balls numbered 3, 4 and 5 are placed in each of two hats. One ball is chosen at random from each hat. Which is the **most likely sum** of the two balls chosen?



(A) 6 (B) 7 (C) 8 (D) 9 (E) 10

Ans:_____

20.



What is the Maximum value of y?

Ans: _____

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FORM 4 **MATHEMATICS SCHEME B** **TIME: 1h 40min**
Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calculator	**Global Mark**
Mark																

DO NOT WRITE ABOVE THIS LINE

Name: _____ **Class:** _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN. ANSWER ALL QUESTIONS.

1. Nigel's car holds 58 litres of petrol when full.

   a) He travelled 640 km on 40 litres of petrol. How many kilometres did Nigel travel on 1 **litre** of petrol?

   Ans:_____ km

   b) How many kilometres would Nigel expect to travel with a **full tank** of petrol?

   Ans:_____ km

   c) How many litres of petrol would he expect to use to cover 200 km?

   Ans:_____ ℓ

   (6 marks)

2. A factory produces paper clips. They checked the contents of 150 boxes
is in this table.

Number of paper clips in box	Number of boxes
98	14
99	22
100	41
101	33
102	30
103	10

(a) Find the range.

Ans: _____

(b) Calculate the mean number of paper clips in a box, giving your answer correct to 1 decimal place.

Ans: _____

(5 marks)

Name_____ Class_____

3. Line AC is parallel to the *x*-axis and line BC is parallel to the *y*-axis.

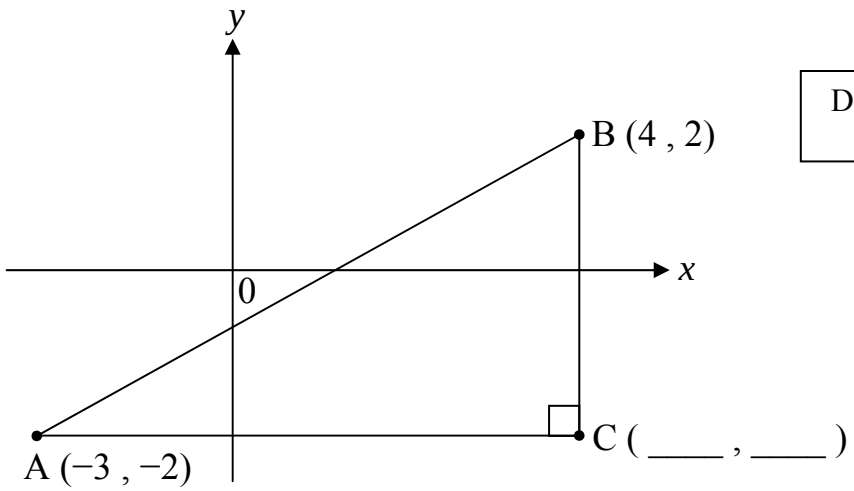


DIAGRAM NOT TO SCALE

a) Fill in the coordinates of point C.

b) How long is AC?

Ans:_____ units

c) How long is BC?

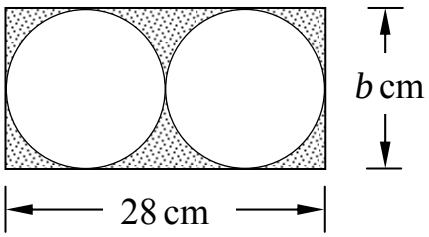
Ans:_____ units

d) Calculate the length of AB, giving your answer correct to 2 significant figures.

Ans:_____ units

(6 marks)

4. Two equal circles fit exactly inside a rectangular piece of cardboard of
28 cm as shown in the diagram.



a) Write down the **value** of ***b***.

Ans: _____

b) Calculate the **area** of the **rectangle**.

Ans: _____cm^2

c) What is the **radius** of each circle?

Ans: _____cm

d) Calculate the **area** of the **two circles**, giving your answer correct to 2 significant figures.

Ans: _____cm^2

e) Calculate the **shaded** area correct to 2 significant figures.

Ans: _____cm^2

(9 marks)

Name_____ Class_____ B

5.

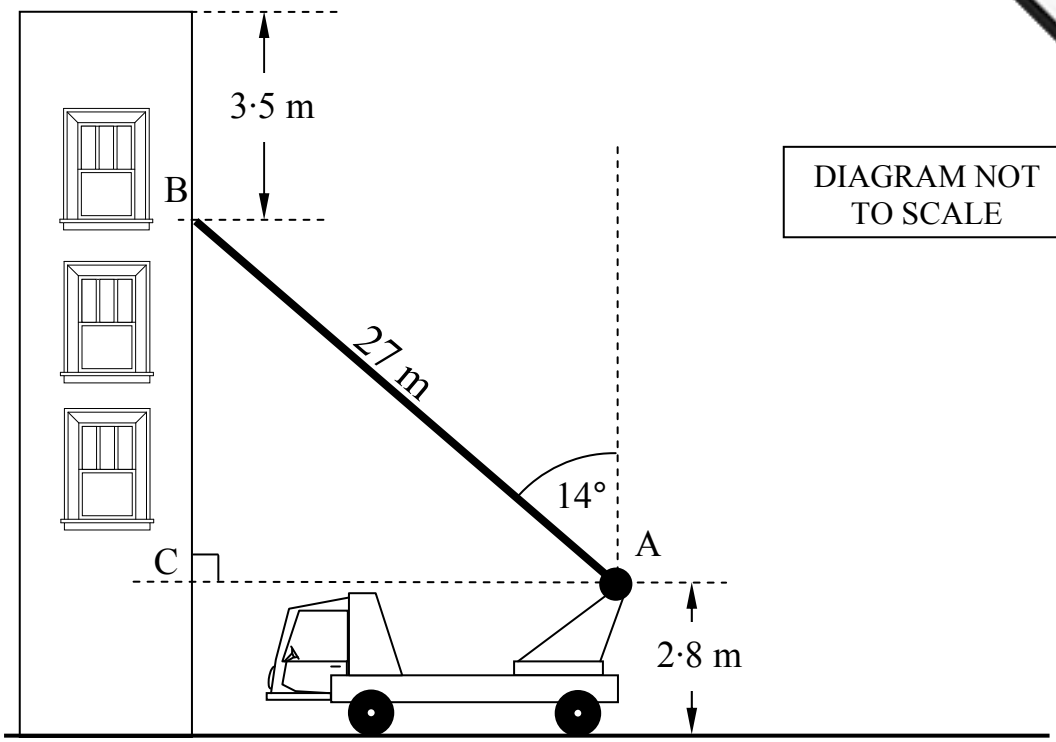


DIAGRAM NOT TO SCALE

A fire escape ladder is mounted on a fire engine 2·8 m above the ground. The ladder is 27 m long and makes an angle of 14° with the vertical. The ladder touches the building at B, 3·5 m from the top of the building.

Calculate in metres, correct to 1 decimal place:

a) the distance AC

Ans:_____m

b) the height of the building.

Ans_____m

(8 marks)

6.

a) A bullet reaches a target 150 m away in 0·75 seconds. Calculate the **speed** of the bullet in m/s.

Ans:_____m/s

b) An aeroplane flies at a steady speed of 448 km/h. **How long** does it take to travel 1120 km?

Ans:_____hours

c) A ship is cruising at a steady speed of 20 km/h. **How far** does it travel in 45 minutes?

Ans:_____km

(7 marks)

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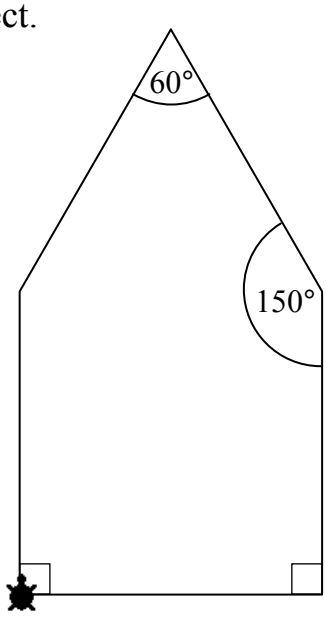
7. Jeremy writes the LOGO program below to draw the pentagon shown. Each side is 70 turtle steps long. However, **one** of the commands is incorrect.

```
PD
FD 70
RT 30
FD 70
RT 120
FD 70
LT 150
FD 70
HOME
```



a) **Underline** the **incorrect** command.

b) What is the **correct** command that Jeremy should use?

Ans:_____

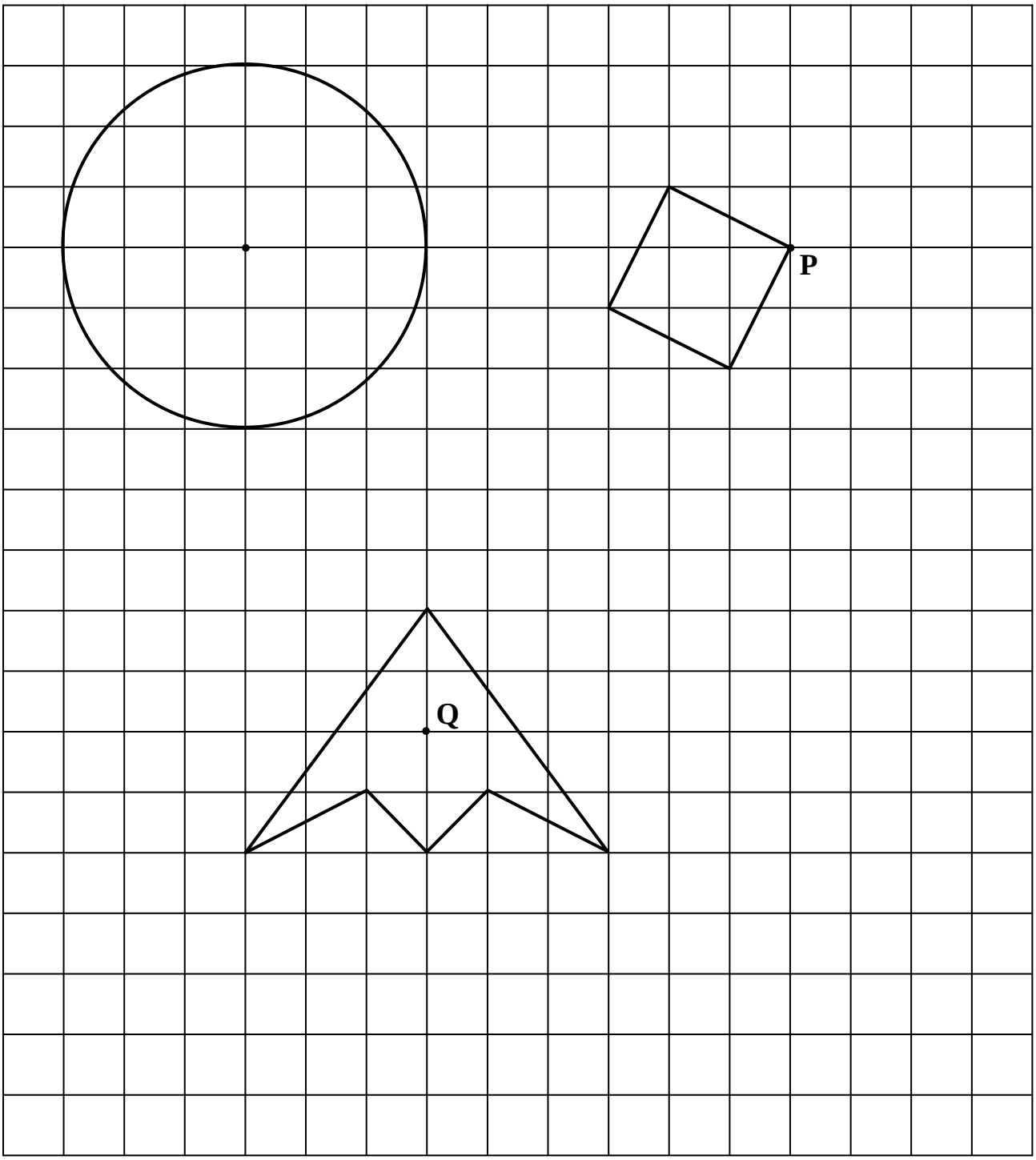
(2 marks)

8.

a) **Translate** the **circle** by the vector $\begin{pmatrix} 9 \\ -6 \end{pmatrix}$.

b) **Rotate** the **square** 180° about point P.

c) Draw the **enlargement** of the **hexagon** by scale factor **2** using point Q as the centre of enlargement.



(6 marks)

9.

a) Factorise completely: $6ab + 12a^2$

Ans:_____

b) Solve the equation: $2(x + 3) + 4x = 36$

Ans: x = _____

c) Simplify: $\frac{7x}{3} + \frac{x-3}{6}$

Ans:_____

(8 marks)

10.

a) A number S is equal to the **sum** of **half** a number b and **three times** a n
c.

i) Write down a formula for S in terms of b and c.

Ans: $S =$_____

ii) Find the value of S when $b = 6$ and $c = 7$.

Ans: $S =$ _____

b)

i) Rearrange the formula $t = 8k - 9$ to make k the subject of the formula.

Ans: $k =$ _____

ii) Find k when $t = 27$.

Ans: $k =$ _____

(7 marks)

11.

a) Consider this pattern.

$5^3 - 4^3 = 5^2 + 5 \times 4 + 4^2 = 61$

$6^3 - 5^3 = 6^2 + 6 \times 5 + 5^2 = 91$

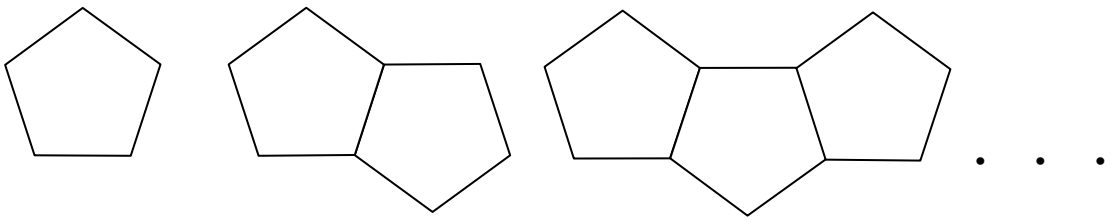
$7^3 - 6^3 = 7^2 + 7 \times 6 + 6^2 = 127$

Use this pattern to complete:

$10^3 - 9^3 =$ ☐ + ☐ × ☐ + ☐ = ☐

b) Consider this pattern. Each pentagon is of side 1 cm.

(i) Write down in the spaces provided, the **perimeter** of each shape.



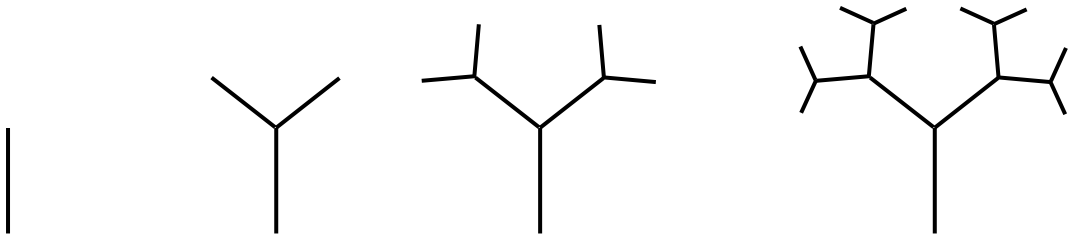
_____ _____ _____ . . .

(ii) If n is the number of pentagons, underline the expression which gives the **perimeter** of each shape in centimetres.

(A) $5n$ (B) $n + 6$ (C) $2n + 3$ (D) $3n + 2$

c) These designs are made by arranging branches in trees.

1st tree 2nd tree 3rd tree 4th tree



1 branch 3 branches 7 branches 15 branches

How many branches would be in the 6th tree?

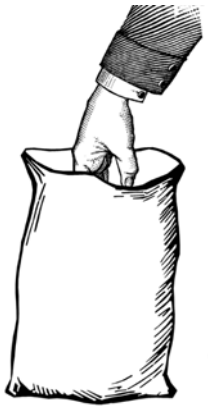
Ans: _____branches

(6 marks)

12. Mr Grima has a bag that contains 12 coloured marbles. He takes a marb
the bag at random, records its colour, and puts it back into the bag. He doe
60 times.

This table shows his results.

Marble Colour	*Frequency*
Blue	30
Red	20
Yellow	10



a) Use the results in the table to estimate the number of blue marbles in the bag.

Ans:_____blue marbles

b) Mr Grima takes another marble out of the bag. Estimate the probability that the marble:

i) is yellow.

Ans: P(yellow) =_____

ii) is **not** red.

Ans: P(Not red) =_____

(5 marks)

13. The diagram shows the position of three lighthouses R, S and T at sea. S
and on a bearing of 036° from R and T is 16 km and on a bearing of 140° f

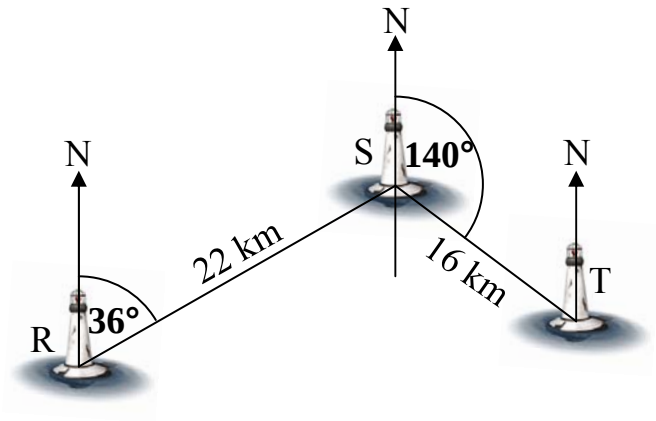
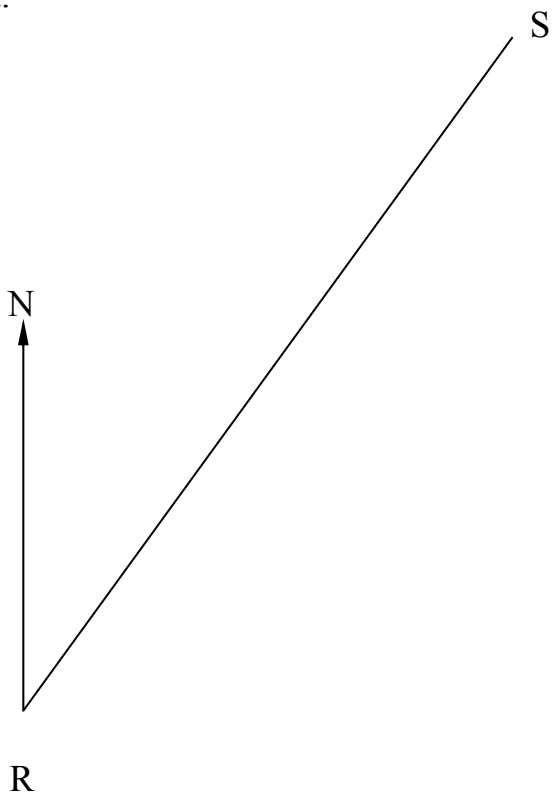


DIAGRAM NOT TO SCALE

a) Calculate ∠RST.

Ans: _____

b) Draw an accurate scale drawing to show the exact positions of the three lighthouses taking 1 cm to represent 2 km. Part of the drawing has been done for you.



c) What is the actual distance between the buoys R and T, giving your answer correct to the nearest kilometre?

Ans: _____km

(5 marks)