KULLEĠĠ SAN BENEDITTU

Boys Secondary School, Kirkop

B

HALF-YEARLY EXAMINATIONS – FEBRUARY 2014

FORM 4   **MATHEMATICS** Scheme B   **TIME: 1hr 40mins**

Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Main	NC	Global Mark
Mark																

DO NOT WRITE ABOVE THIS LINE

NAME AND SURNAME:_____ **CLASS:_____**

INSTRUCTIONS TO CANDIDATES:

Read all the questions carefully before you start answering.

- Answer all questions.
- This paper carries 80 marks.
- Calculators and mathematical instruments are allowed but all necessary working must be shown.

1. (a) Give a number which is:

   (i) a prime number ⎤
       an even number   ⎦ ☐

   (ii) a factor of 24   ⎤
        a multiple of 3 ⎬ ☐
        less than 10   ⎦

   (b) Complete the missing numbers:

   (i) $6^{\square} = 36$ (ii) $5^6 \times 5^{\square} = 5^4$

   (c) Put $>$ or $<$:   (i) $3^4 \,\square\, 4^2$ (ii) $3^1 \,\square\, 1^3$
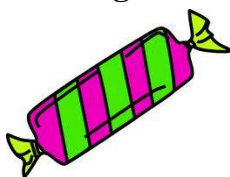
_____(6 marks)

2. (a) Use your calculator to work out the following, giving your answer correct to **3 significant figures:**

(i) $\sqrt{35} =$ _____

(ii) $\dfrac{5.32^2 \times 4.17}{1.8 + 3.7} =$ _____

(b) Alexia buys sweets at a sweet shop.
She picks up sweets that cost €3.25 per kg. Her bag weighs 0.561 kg.

(i) **Estimate** the cost of the sweets by rounding each number correct to **1 significant figure**.

Answer: € _____

(ii) Work out the **exact price** of the sweets.
Give your answer to **the nearest cent**.

Answer: € _____

_____(6 marks)

3. (a) Find the **10th** term of a sequence, given that the nth **term** is **5 – 3n.**

Answer: _____

(b) A house is built by 30 workers in 20 days.

(i) How long would it take 40 workers to build the same house?

Answer: _____ **days**

(ii) How many workers would be needed to build the same house in 25 days?

Answer: _____ **workers**

_____(5 marks)

4. (a) Make x the subject of the formula: $x + 3y = 2z$

Answer: $x =$ _____

(b) Look at the formula $a = \dfrac{b-1}{5}$.

   (i) Find the value of a when $b = -19.$

Answer: $a =$ _____

(ii) Re-arrange the formula $a = \dfrac{b-1}{5}$ to make b the subject.

Answer: $b =$ _____

(iii) Find the value of b when $a = 10.$

Answer: $b =$ _____

_____(6 marks)

5. **Example**: The prime factors of 18 are: $18 = 2 \times 3 \times 3 = 2 \times 3^2$

   a) Express the following as a product of prime factors:

   i) 36   ii) 60

Answer: 36 = _____   **Answer: 60 =** _____

   b) Andrew plants trees in rows of 36 while his friend Ella plants trees in rows of 60. If they have to plant the same number of plants, what is the **smallest** number that each will have to plant, and still have **full** rows planted?

Answer: _____ plants

_____(7 marks)

6. (a) Write in order, smallest first: $\dfrac{3}{4}$, $\dfrac{5}{8}$, 0.52 , 0.9

Answer: _____

   (b) (i) An American tourist changes **$850 to euro (€)** when the exchange rate is **€1 = $1.356**.

   Calculate the amount he receives. Give your answer correct to **2 decimal places**.

Answer: € _____

   (ii) The tourist returns home with **€150** and changes it back into US Dollars($). How much is this amount worth in $?

Answer: $ _____

_____(6 marks)

7. Aluminium flowerpots, shaped like cylinders, are 12.5 cm high and have a diameter of 25.8 cm.
There is a **bottom** on each pot, but **no top**.
Calculate the surface area of aluminium needed for each pot, giving your answer correct to the nearest cm^2.

Answer: _____ cm^2

_____(6 marks)

8. (a) **Simplify** these algebraic expressions.

(i) $7a - 3a^2 - 10a + 5a^2$

Answer: _____

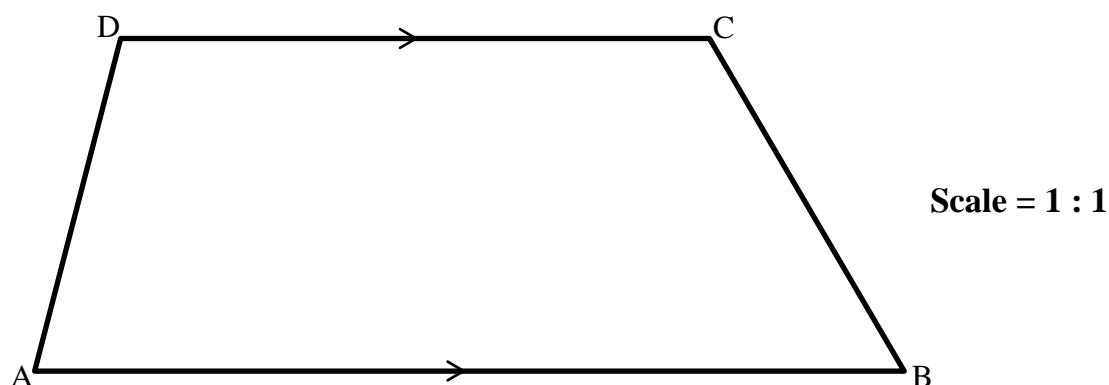(ii) $\dfrac{5x}{2} + \dfrac{2(x-1)}{3}$

Answer: _____
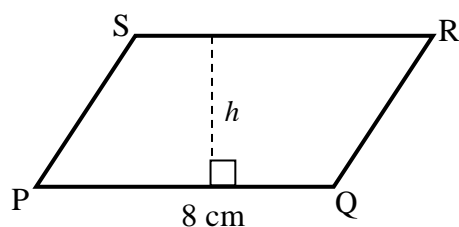
(b) **Solve**: $4(3x - 1) - 2(x + 5) = 26$

Answer: _____

_____(8 marks)

9. (a) The diagram shows a scale drawing of trapezium ABCD.

Scale = 1 : 1

(i) On the diagram, measure and label the dimensions needed to find the area of this trapezium.

(ii) Calculate the **area** of trapezium ABCD, correct to **2 decimal places**.

Answer: _____ cm^2

(b) The following parallelogram PQRS has the **same area** as trapezium ABCD in (a). Calculate the **height _h_** of the parallelogram, giving your answer correct to the **nearest cm**.
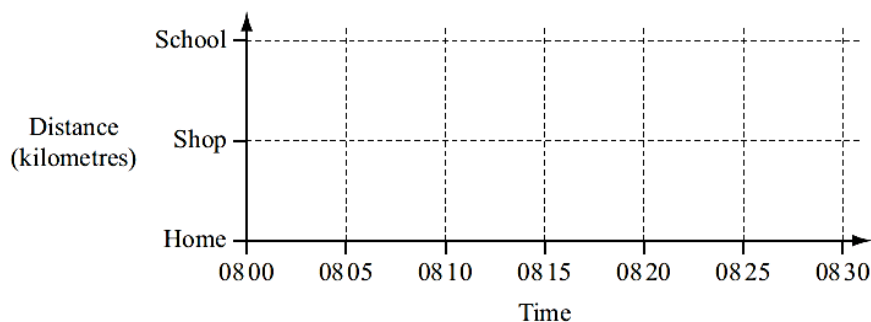

Answer: $h =$ _____ cm

_____(7 marks)

10. (a) Mark walks to school each morning. One day, he leaves home at 08:00.
He stops at a shop at 08:10 and stays there for 5 minutes.
He then continues to school and arrives at 08:30.

(i) Draw the travel graph for Mark's journey from home to school.

(ii) Mark's school is **1.25 km** away from his home.
Calculate his average speed, for the whole journey, in **km/hr**.

Answer: _____ km/hr

(b) Bob and Kevin are having a race in their sport cars. Bob drives his car at an
average speed of 200 km/hr and Kevin at an average speed of 160 km/hr.

(i) After $1\frac{1}{2}$ hours Bob finishes the race.
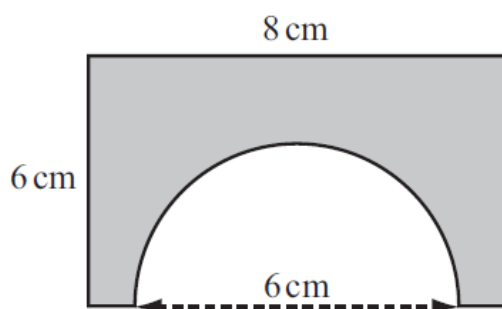Calculate the **distance** that Bob travels.

Answer: Distance = _____ km

(ii) Calculate the **time**, in **hours**, taken by Kevin to finish the race.
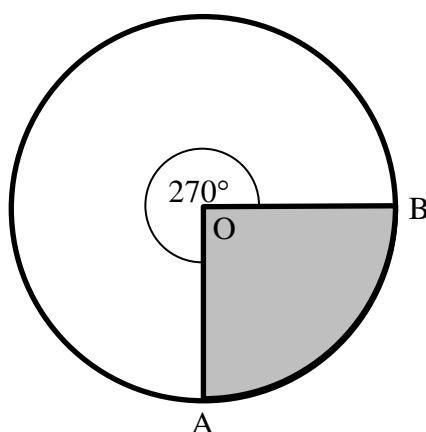
Answer: Time = _____ hours

(7 marks)

11. (a) A semicircle of diameter 6 cm is cut from a rectangle with sides 6 cm and 8 cm. Calculate the **shaded area**, correct to **1 decimal place**.

8 cm

6 cm

6 cm

Answer: Area = _____ cm^2

(b) The diagram shows a circle with **radius 5.5 cm**, divided into 2 sectors.

270°
O
B
A

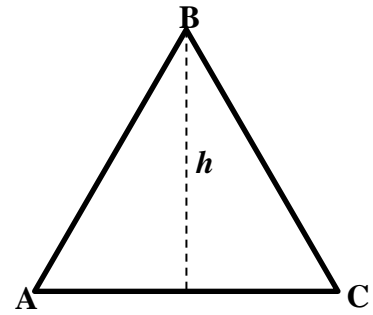(i) What **fraction** of the circle is the shaded sector AOB?

Answer: _____

(ii) Work out the **length of the minor arc AB**, correct to **1 decimal place**.

Answer: Length of arc AB = _____ cm

_____(8 marks)

12. Triangle ABC is an equilateral triangle of side 4.6cm.

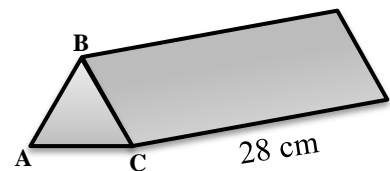(a) (i) Work out the length of the perpendicular height, h, correct to **3 significant figures**.

Answer: $h = $ _____ cm

(ii) Hence find the area of triangle ABC, correct to **3 decimal places**.

Answer: _____ cm^2

(b) Triangle ABC is the cross-section of a chocolate tube, which is 28 cm long.

Calculate the volume of the tube. Give your answer correct to the nearest cm^3.

28 cm

Answer: _____ cm^3

(c) These chocolate tubes are packed in **cylindrical** gift packs of radius 10 cm and length 30 cm.

How many chocolate tubes can be fitted in 1 gift pack?

Answer: _____ tubes

_____(8 marks)

END OF PAPER