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| Name:  | Class: **SUGGESTED SOLUTIONS** | Class Register No: |
| **CHUNG CHENG HIGH SCHOOL (MAIN)** | **50** |
|  |
| Parent’s Signature |
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| **END OF YEAR EXAMINATION 2009****SECONDARY 1** |
| **Mathematics** |  **Tuesday, 13 October** |
| **Paper 2**  | **1 hour 15 minutes** |

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| ***Instructions to Candidates:*** |
| 1. Write your name, class and class register number in the space provided on the cover page of this booklet.
2. All answers are to be written on the question paper in the space provided.
3. If you use more paper than the booklet, fasten the sheets together.
4. If working is needed for any question, it must be shown clearly in the space provided for that question.
5. Workings must be shown clearly in dark blue or black ink.
6. Do not use staples, paper clips, glue or correction fluid.
7. Diagrams are to be drawn neatly and clearly in pencil.

***Additional Materials:*** * 1 Graph Paper (attached)

***Information For Candidates:*****CALCULATORS AND MATHEMATICAL TABLES ARE ALLOWED FOR THIS PAPER but all essential workings must still be shown.****OMISSION OF ESSENTIAL WORKINGS WILL RESULT IN LOSS OF MARKS.** If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.The intended marks for the question or parts of the question are given in brackets [ ].The total number of marks for this paper is 50.**You are reminded of the need for clear presentation in your answers.** This question paper consists of **11** printed pages (including this cover page). |
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| *For**Examiner's**Use*

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| *For**Examiner's**Use* *For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use***M1 CAO – volume of cuboid***For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use*

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 | **Answer all the questions.** 1. Use a calculator to evaluate and leave your answer as a fraction.

  *Answer*  **(B1)**…...……………[1]1. The table below shows the Pollutant Standards Index (PSI)\* reading of Singapore in the month of July 2009.

\* *PSI provides information about daily levels of air pollution*.

|  |  |
| --- | --- |
| **Date** | **PSI** |
| 10 | 50 |
| 11 | 40 |
| 12 | 45 |
| 13 | 31 |
| 14 | 35 |
| 15 | 33 |
| 16 | ***a*** |

 (Source extracted from <http://app2.nea.gov.sg/psimonthly.aspx>)Use the table above to help you answer the following questions. 1. Calculate the **percentage decrease** of the PSI reading in Singapore from 10th to 11th July 2009.
2. Given that the **percentage increase** of PSI reading from 15th to 16th of July 2009 is, find the PSI reading on the 16th July 2009.

------------------------------------------------------------------------------------------------- **A1** **M1 CA0****A1** **M1 CA0***Answer* (a) ………….……………………...[2]  (b) …………………………………[2]1. John bought *x* markers and 10 more crayons than markers.
2. Write down, in terms of *x*, an expression for the number of crayons that he buys.
3. Each marker costs 70 cents and each crayon costs 30 cents. Find as simply as possible, in terms of *x*, an expression for the total cost of the markers and crayons John buys.
4. If he spends $15 altogether, find the number of crayons he buys.

--------------------------------------------------------------------------------------------------------**B1*** 1. No. of crayons he buys = *x* + 10
	2. Total cost = $ [0.7*x* + (*x* + 10)0.3]

 = $ (0.7*x* + 0.3*x* + 3)**B1** = $ (*x* + 3)* 1. *x* + 3 = 15

**M1: Ability to equate ans from part (b) to $15***x* = 12No of crayons he buys = 12 + 10  = 22**A1**  *Answer* (a) *x* + 10 **(B1)**…………………………. [1] 1. $ (*x* + 3) **(B1)**….……….…....………[1]
2. .……………..….……….…....……..[2]
3. *PQ*, *QR* and *RS* are adjacent sides of a regular polygon. Given that ,

 calculate1. the exterior angle of the polygon,
2. the number of sides of the polygon,
3. .

*P**Q**R*6°*S*-------------------------------------------------------------------------------------------------------- **A1****A1****M1 CAO****B1****A1** *Answer* (a) ………..…………….………… ° [2]  (b) 30 **(B1)**……………………………1] (c)= ...….……….…....….…. ° [1]1. A series of figures of shaded and unshaded small squares is shown below. The shaded squares are those that formed a cross-shaped display in the centre. All the other small squares are unshaded.

Figure 3Figure 2Figure 1The table below shows the number of small squares.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Figure | 1 | 2 | 3 | 4 | image002 | *n* |
| Number of shaded squares | 5 | 9 | 13 |   | image002 | *a* |
| Number of unshaded squares | 4 | 12 | 20 |   | image002 | *b* |

 * + 1. Complete Figure 4 column for the

(i)      number of shaded squares,(ii)     number of unshaded squares,1. Write an equation connecting *n* and *a,*
2. Find the number of small shaded squares in Figure 99.

*Answer* (a) (i) **17** **(B1)**………………………[1]  (ii) **28** **(B1)**……………..…….…[1]* + 1. *a* = **4n + 1** **(B1)**…..………..……[1]
		2. **397** **(B1)**.……….…..……………[1]
1. In the diagram as shown below, a cylinder with a diameter of 20 cm has been removed from the cuboid. After the cylinder has been removed, there are four resulting identical solids. Given that *XY* = *YZ*, find
2. the total surface area of all the four resulting solids,
3. the volume of the resulting four identical solids,
4. the mass of the resulting four solids if the density is given as 9.82 g/cm3.

(Take π as 3.142) 20 cmYZ48 cmXqn.JPG--------------------------------------------------------------------------------*Answer* (a)………….………………… cm2 [4]  (b) …………………………… cm3 [3]  (c)………………………………. g [2] **M1 CAO****M1 CAO****M1 CAO****A1****M1 CAO – volume of cylinder****A1****M1: Ability to use ans in part (b) to multiply by 9.82g/cm3****A1**1. In the diagram below, *PQ* = 24cm and *PU*= 16cm. Given that *QTR* is an isosceles triangle with an area of 48cm2 and *TS* = *SR*. Calculate
	* 1. the length of *TR*,

16 cm24 cmPQRSTU* + 1. the area of trapezium *PQTU*.

---------------------------------------------------------------------------------------------------------------------------**A1****M1 CAO****A1****M1 CAO****A1** **M1 CAO***Answer* (a) *TR* = …….………………… cm [2]  (b) ………………………...… cm2 [2]1. The pie chart shows the primary schools in which the Secondary One students of Chung Cheng High School (Main) in 2009 graduated from. The total number of the Secondary One students in Chung Cheng High School (Main) in 2009 is 420.
	1. Find the value of the ratio .
	2. Given that 175 of the students graduate from TNS, calculate the value of *x*.
	3. Find the number of students who fall under the ‘others’ category.
	4. Find the percentage of the students who graduate from KHS.

KHSMBSTNSOthers126°72°*x*°-----------------------------------------------------------------------------**B1****A1****M1 CAO****B1** **B1**  *Answer* (a)  **(B1)** …………………...…… [1] (b) *x* = **150** **(B1)** …………..........… [1](c ) ………………………………… [2](d) **35%** **(B1)**……………………… [1]1. In the triangle *ABC*, *AB* = 8.4cm, *BC* = 9.2cm and *AC* = 4 cm.

The side *AB* is drawn in the answer space below. 1. Complete the two possible triangles. [2]
2. For **one** of these triangles, construct
	1. the angle bisector of *BAC*, [1]
	2. the perpendicular bisector of *AC*. [1]
3. Label the point of intersection of (b) (i) and (b) (ii) as point *X*. [1]
4. Measure and write down
	1. the length of *AX*,
	2. the *XAB*.

AB  *Answer* (d) (i) *AX* =**5.9** *[Range: 5.8 to 6.0 cm]* **(A1)** cm …………° [1] (ii) *XAB* = 44° *[Range: 43* °*to 45*° *cm]* **(A1)** …….…° [1]***(Answer this whole question on the graph paper provided)*** * 1. Copy and complete the table below: [1]

|  |  |  |  |
| --- | --- | --- | --- |
|  | -2 | 2 | 6 |
|  | ***-3*** | ***-1*** | ***1*** |

  * 1. Draw the graph of  for , using a scale of 2 cm to represent 1 unit for the x-axis and 4 cm to represent 1 unit for the y-axis .

 [2]* 1. The point  lies on the graph .Use your graph to find the value of .  ***ANS a = -1.75*** [1]
	2. From your graph, find the value of

 (i) , when , ***ANS x =4***  [1] (ii) , when . ***ANS x =0.7*** [1]* 1. Use your graph to calculate the gradient of the line . [2]

***ANS gradient =0.5*** - End of Paper - | *For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use**For**Examiner's**Use* *For**Examiner's**Use**For**Examiner's**Use* |