HILLGROVE
SECONDARY SCHOOL

END OF YEAR EXAMINATION 2012

Secondary 1 Express

MATHEMATICS **4016/01**

Paper 1

DATE: 8 October 2012

TIME: 7.50 a.m. – 8.50 a.m. **Duration: 1 hour**

INSTRUCTIONS TO STUDENTS

Write your name, index number and class on the question paper.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions in the spaces provided in the question paper.
If working is needed for any question it must be shown in the space below the question.
Omission of essential working will result in loss of marks.
You are expected to use a scientific calculator to evaluate explicit numerical expressions.
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 number of marks is given in brackets [ ] at the end of each question or part question.
The total number of the marks for this paper is 50.

Name: _____ ( )

Class : _____ Parent's Signature: _____

Band : _____

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50

Setter : Mdm Teh GL

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Answer all the questions

1. (a) Express 3375 as a product of prime factors, giving your answer in index notation.

   (b) Hence, find the value of $\sqrt[3]{3375}$.

Answer (a) _____ [1]

(b) _____ [1]

---

2. Express

   (a) $\frac{3}{11}$ as a decimal,

   (b) $12\frac{1}{5}\%$ as a fraction.

Answer (a) _____ [1]

(b) _____ [1]

---

3. Evaluate, without the use of a calculator, by showing your workings clearly,

   (a) $-8-(-23)$,

   (b) $54+[(-31)+27]\times(-4)$,

   (c) $\frac{9-11}{(-2)^2\times 3+(-4)\times(5)}$.

Answer (a) _____ [1]

(b) _____ [2]

(c) _____ [2]

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4. Given that $a = 5$ and $b = -\frac{1}{3}$, evaluate

(a) $2a + b$,

(b) $\frac{18b^2 + 3ab}{a}$.

Answer (a) _____ [2]

(b) _____ [2]

---

5. Estimate $\frac{\sqrt{48.5} \times 9.999}{3.004 + 31.73}$, giving your answer correct to 1 significant figure.

Answer _____ [2]

---

6. Expressed as the product of prime factors,
$84 = 2^2 \times 3 \times 7$ and $162 = 2 \times 3^4$.

Use these results to find

(a) the largest integer which is a factor of both 84 and 162,

(b) the smallest positive integer value of n for which $84n$ is a multiple of 162.

Answer (a) _____ [1]

(b) _____ [1]

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7. Write an algebraic expression for each of the following.

(a) Subtract $x^4 + 2x^3$ from $5x^4 + 3x + 10x^3 - 1$.

(b) The cost of x bowls at \$12.24 per dozen bowl.

(c) Add 7 to the product of $3h$ and $5j$.

Answer (a) _____ [1]

(b) \$_____ [1]

(c) _____ [1]

---

8. Given the following list of real numbers,

$$-\frac{2}{11},\ -1,\ \pi,\ \sqrt[3]{-27},\ \sqrt{7},\ 0.\dot{3}2\dot{6}.$$

Write down the

(a) integers,

(b) irrational numbers.

Answer (a) _____ [1]

(b) _____ [1]

---

9. Factorise completely

(a) $8n^2 - 2n$,

(b) $6px - 2py - 12qx + 4qy$.

Answer (a) _____ [1]

(b) _____ [2]

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10. (a) Solve the inequality $5a - 6 > 8a + 3$.

(b) Solve the equation $\frac{3}{x+20} = \frac{1}{x+4}$.

Answer (a) _____ [2]

(b) _____ [2]

---

11. Ban Seng has to take a bus ride that covers 8 km and then walk 300 m to reach his school. The bus travels at an average speed of 24 km/h and the walk takes 6 minutes. Find

(a) the time taken for the bus ride in minutes,

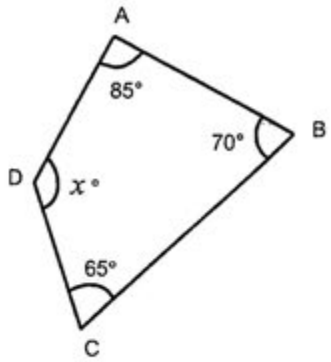
(b) the average speed for the entire journey in km/h.

Answer (a) _____ minutes [2]

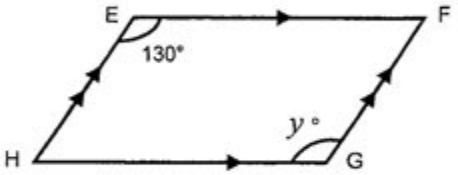
(b) _____ km/h [2]

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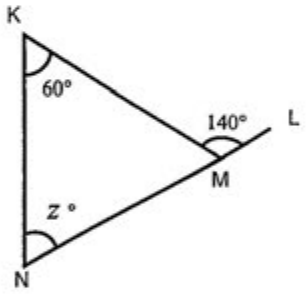
12. (a) *ABCD* is a quadrilateral. $\angle DAB = 85°$, $\angle ABC = 70°$ and $\angle BCD = 65°$. Find the value of x.



(b) *EFGH* is a parallelogram and $\angle HEF = 130°$. Find the value of y.



(c) *KMN* is a triangle and *LMN* is a straight line. $\angle NKM = 60°$ and $\angle KML = 140°$. Find the value of z.



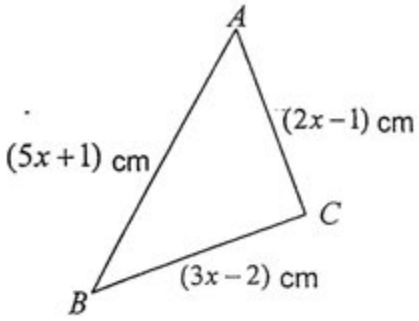
Answer (a) _____ [2]

(b) _____ [1]

(c) _____ [1]

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13. The length of sides of triangle ABC are $(2x-1)$ cm, $(3x-2)$ cm and $(5x+1)$ cm as shown in the diagram.



(a) Find the perimeter of the triangle in terms of x .

(b) If the perimeter of the triangle is 48 cm, find the

(i) value of x,

(ii) length of the longest side.

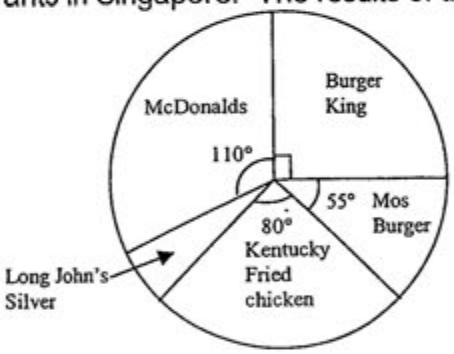
Answer *(a)* _____ cm [1]

(bi) _____ cm [2]

(bii) _____ cm [1]

---

14. 720 students at LaSa Bolleh Secondary School were surveyed on their choice for their favourite fast food restaurants in Singapore. The results of their choices are shown in the pie chart.



(a) Calculate the angle of the sector representing Long John's Silver.

(b) Write down the most preferred fast food restaurant.

(c) Calculate the number of students who preferred McDonalds.

(d) Calculate the percentage of students who preferred Kentucky Fried chicken.

Answer *(a)* _____ ° [1]

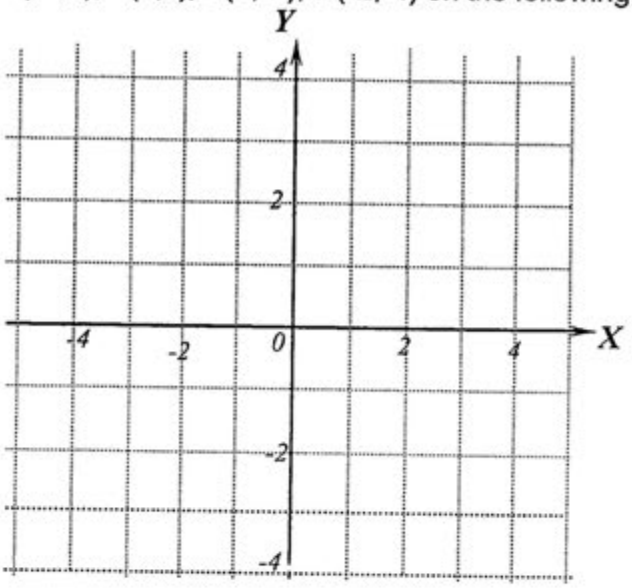
(b) _____ [1]

(c) _____ [1]

(d) _____ % [1]

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15. (a) Mark the points A(-2,1), B(3,3), C(3,-2), D(-2,-4) on the following grid. [2]



(b) Join the points in the order ABCD [1]

(c) Name the shape obtained. _____ [1]

(d) Hence, find the area of the shape obtained. _____ [1]

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HILLGROVE
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END OF YEAR EXAMINATION 2012

Secondary 1 Express

MATHEMATICS **4016/02**
Paper 2

DATE: 5 Oct 2012

TIME : 9.15 a.m. – 10.30 a.m. **Duration: 1 hour 15 mins**

INSTRUCTIONS TO STUDENTS

Write your name, index number and class on the question paper.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions in the spaces provided in the question paper.
If working is needed for any question it must be shown in the space below the question.
Omission of essential working will result in loss of marks.

You are expected to use a scientific calculator to evaluate explicit numerical expressions.
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.
For π, use $\frac{22}{7}$ unless otherwise stated.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of the marks for this paper is 50.

Name: _____ ( )

Class: _____ Parent's Signature: _____

Band : _____

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Answer **all** the questions.

1. (a) Evaluate $\frac{-2.2-0.4^2}{9.9-\sqrt[3]{4.5}}$, giving your answer correct to 2 significant figures. [1]

   (b) Decrease A$350 in the ratio 5 : 7. [1]

   (c) Find the ratio of $x : y$ for $6.4x = 2.4y$. [2]

---

2. Simplify the following expressions.

   (a) $5x - 2(3-4x)$, [2]

   (b) $\frac{3x-1}{4} - \frac{4(x+7)}{2}$. [2]

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3. (a) If $\frac{1}{x}=\frac{y^2+z}{3}$, find x when $y=2$ and $z=8$. [2]

(b) Find the smallest value of k, when $504k$ is a perfect square. [2]

(c) Convert 3.7 km/h to m/s. [1]

---

4. Four students took 3 hours to arrange 700 chairs in the school hall. Calculate

(a) the number of students that are needed to complete the same job in 30 minutes, [2]

(b) the percentage increase in the extra number of students needed. [2]

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5. The temperature at 0800 is $-2^{\circ}C$. The temperature at 1400 is $14^{\circ}C$. Find

(a) the difference between the two temperatures, [1]

(b) the temperature at 1100, assuming the temperature rises at a steady rate. [2]

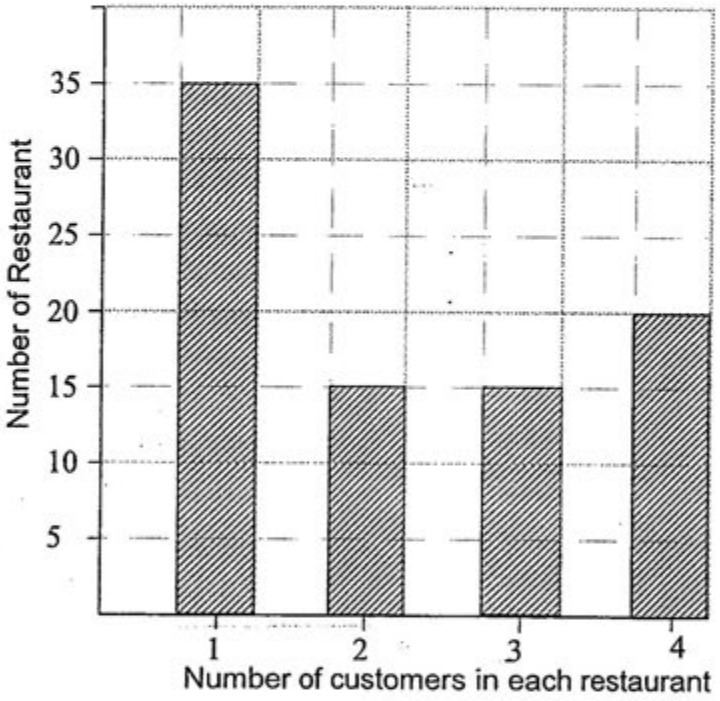
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6. The bar graph below shows the results of a survey conducted to find the number of customers in each restaurant at a certain time of the day. Find

(a) the total number of restaurants surveyed, [1]

(b) the total number of customers in those restaurants, [1]

(c) the percentage of restaurants who have more than 2 customers. [2]



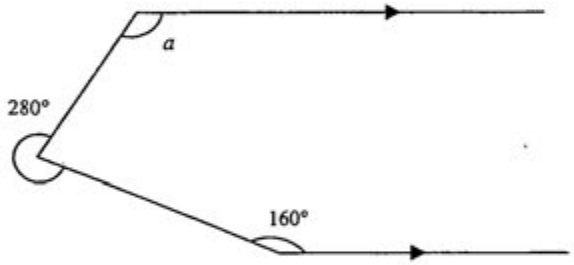
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7. A polygon has n sides. Two of its exterior angles are 26° and 40°, while three of the interior angles are 152° each. The remaining interior angles are 174° each.
Find the value of n. [3]

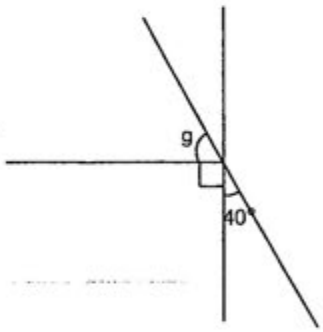
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8. Find the following unknown angles, stating the reasons clearly.

(a) [2]



(b) [2]

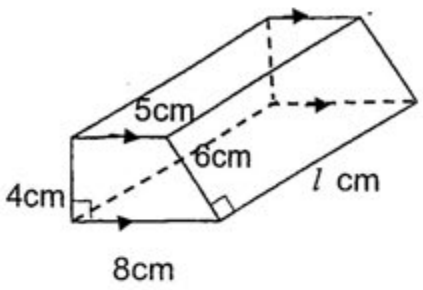


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9. The prism has a volume of 520 cm^3. Calculate

(a) the area of the cross-section, [2]

(b) the length, l, of the prism. [2]



---

10. The terms T_1, T_2, T_3, T_4 of a sequence are given as follows:

$T_1 = 2^3 - 1^2 = 7$

$T_2 = 3^3 - 2^2 = 23$

$T_3 = 4^3 - 3^2 = 55$

$T_4 = 5^3 - 4^2 = 109$

(a) Write down T_7 in the sequence. [1]

(b) Use the pattern to find the integers x and y such that $x^3 - y^2 = 919$. [2]

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11. Construct a quadrilateral $WXYZ$, such that WX = 6 cm, $\angle WXY = 95°$, XY =7 cm, $\angle XWZ = 100°$ and WZ = 8.5 cm. [2]

(a) Measure $\angle XYZ$. [1]

(b) Construct a perpendicular bisector of the line WX. [1]

(c) Construct an angle bisector for $\angle XWZ$. [1]

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12. **Answer the whole of this question on a sheet of graph paper.**

(a) Complete this table of values for $y = -x + 2$. [2]

x	-2	0	2
y			

(b) Using a scale of 2 cm to represent 1 unit on both axes, draw the graph of $y = -x + 2$ for $-2 \leq x \leq 2$. [3]

(c) From the graph, find

(i) the value of y when $x = -1$, [1]

(ii) the gradient of equation $y = -x + 2$. [1]

----------End Of Paper----------

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