



SIGLAP SECONDARY SCHOOL

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Mathematics 4016/1 End Of Year Examination 2011 Secondary One Express

Name : _____ () Date : 11 Oct 2011

Class : 1E() Duration : 1 h 30 mins

READ THESE INSTRUCTIONS FIRST

Write your name and index number on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
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 this paper
The number of marks is given in brackets [] at the end of each question or part question.

Omission of essential working will result in loss of marks.
The total number of marks for this paper is 60.

The use of an electronic calculator is expected, where appropriate.
If the degree of accuracy is not specific 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 either your calculator value or 3.142, unless the question requires the answer in terms of π .

You are reminded of the need for clear presentation in your answers.

Score			
Total marks	60	Parent's Signature	Date

Do not turn the pages until you are told to do so

This paper consists of **11** printed pages and **1** blank page.

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[Turn Over

Answer all questions.

1. (a) Find, in its simplest form, the fraction which is exactly halfway between $\frac{7}{9}$ and $\frac{8}{9}$.
- (b) Without using calculator, evaluate $\left(-2\frac{1}{2} + \frac{5}{3}\right) \div \left(-4\frac{1}{3}\right)$.
Show your workings clearly. Give your answer as a fraction in its simplest form.

Ans : (a) _____ [1]

(b) _____ [2]

2. Evaluate each of the following, giving your answers correct to 3 significant figures.

(a) $12.352 - 1\frac{5}{11} \times \frac{8.92}{(1.357)^2}$

(b) $\frac{3\pi - 26.3}{\sqrt{12.65 \div 0.02}}$

Ans : (a) _____ [1]

(b) _____ [1]

3. (a) If one fifth of 2520 is the same as $2^x \times 3^y \times 7^z$,
what are the values of x , y and z ?
- (b) Hence or otherwise, find the smallest value of k where $2^x \times 3^y \times 7^z \times k$ is a perfect cube.

Ans : (a) $x =$ _____ [1]

$y =$ _____ [1]

$z =$ _____ [1]

(b) _____ [1]

4. Consider the following numbers:

$$\sqrt{2}, \frac{18}{5}, \sqrt{64}, -\frac{9}{3}, 0.78, 0$$

Write down the

- (a) integers
- (b) irrational numbers

Ans : (a) _____ [1]

(b) _____ [1]

5. A cyclist travels 10.8 km in 1 hour. Find its average speed in

(a) m/min,

(b) cm/s.

Ans : (a) _____ m/min [1]

(b) _____ cm/s [1]

6. Given that $C = F^2 + \frac{1}{2}pn$, find the value of n when $F = 5$, $p = 0.4$, and $C = 65$.

Ans : _____ [2]

7. Factorize the following completely

(a) $-6rs - 24st$,

(b) $9gh + 45h - 15 - 3g$.

Ans : (a) _____ [1]

(b) _____ [2]

8. (a) Simplify $2[3p - 2(p - 2q)]$.
- (b) Subtract the sum of $5ab + a - 3b$ and $2a - 4b + ba$ from $10 - 7ab$.

Ans : (a) _____ [2]

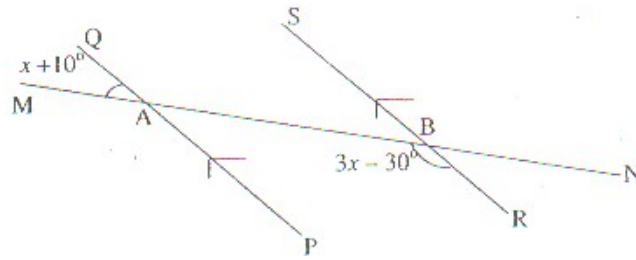
(b) _____ [3]

9. Eugene has $2x$ books.
 Hafiz has 4 more books than Eugene.
 Darren has half as many books as Hafiz.
- (a) Write down an expression, in terms of x , for the number of books that Darren has.
- (b) The total number of books is 121. Find the number of books that Hafiz has.

Ans : (a) _____ [1]

(b) _____ [2]

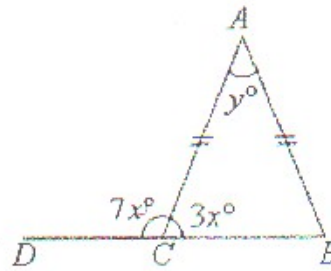
10. In the figure, $PQ \parallel RS$, $\angle QAM = x + 10^\circ$ and $\angle ABR = 3x - 30^\circ$. Find the value of x .



Ans : _____ [2]

11. Given that $AB = AC$, $\angle ACD = 7x^\circ$, $\angle BCA = 3x^\circ$ and $\angle BAC = y^\circ$, calculate the value of

- (a) x ,
 (b) y .



Ans : (a) _____ [2]

(b) _____ [1]

12. Consider the number pattern below:

5, 11, 17, 23, 29, 35, 41, ...

- (a) Write down the 10th term of the pattern.
 (b) Write down the nth term of the pattern.

Ans : (a) _____ [1]

(b) _____ [1]

13. (a) During the Great Singapore Sale, the prices of Mokia handphones were sold at 30% discount. William bought the phone before the sale started. How much did he pay for it if the price of the phone during the sale was \$285 ?
Give your answer to the nearest cents.
- (b) Mr Aqeel bought a condominium in 2004 for \$500 000. He sold it in 2010 for \$650 000. Find the percentage increase in the price of the condominium.

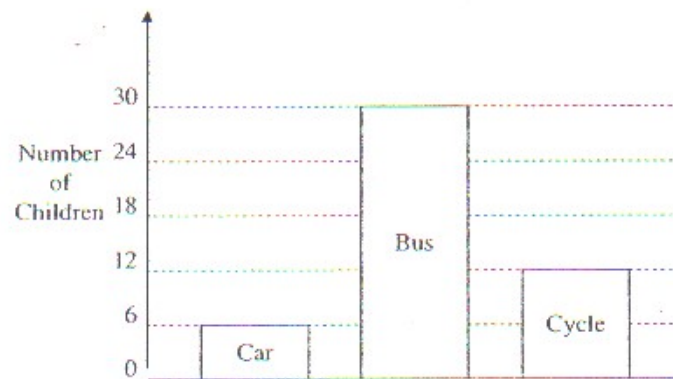
Ans : (a) \$ _____ [2]

(b) _____ % [2]

14. A sum of money was divided between A , B and C in the ratio $2 : 3 : 4$.
If instead, this money had been divided equally between them, A would have received an extra \$20. What was the total sum of money?

Ans : \$ _____ [2]

15. In a survey, 48 children were asked how they travelled to school.
The results of the survey are shown in the bar chart.



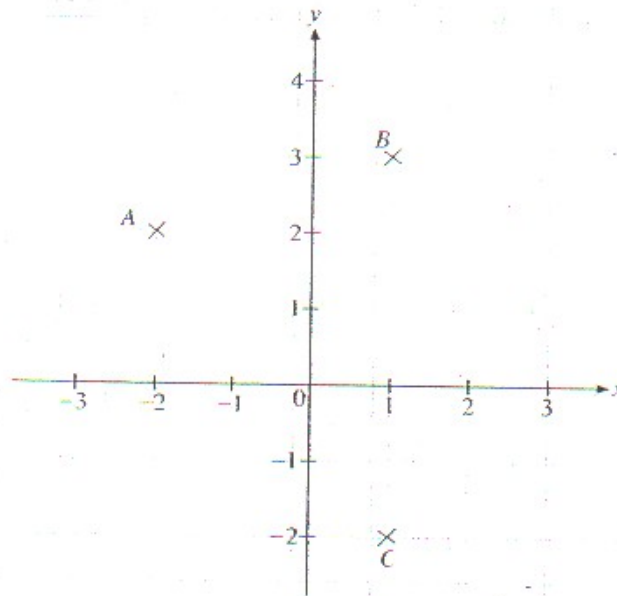
- (a) Express the total number of children who travelled by bus or cycled as a fraction of the total number of children.
Give your answer in its lowest terms.
- (b) The same information is to be shown in a pie chart.
Find the angle which represents the children who travelled by car.
- (c) Calculate the percentage of children who travelled by bus to school.

Ans : (a) _____ [1]

(b) _____^o [2]

(c) _____% [1]

16.



- Write down the coordinates of points A and C.
- Plot the point $D(-2, 0)$ and label it clearly. Join all the points and write down the name of the quadrilateral $ABCD$.
- Find the area of the quadrilateral $ABCD$.
- Find the gradient of AB .

Ans : (a) A (,) [1]

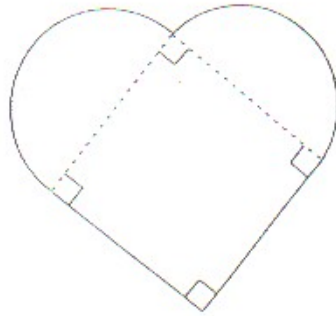
C (,) [1]

(b) _____ [2]

(c) _____ square units [2]

(d) _____ [2]

17.



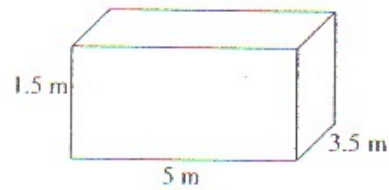
Saran made a Valentine's Day card which is made from a square and two semi-circles. If the area of the square is 100 cm^2 , calculate

- (a) the total area of the card,
- (b) the perimeter of the card.
- (Take π to be 3.14)

Ans : (a) _____ cm^2 [2]

(b) _____ cm [2]

18.



A swimming pool measures 3.5 m by 5 m and the height of the wall is 1.5 m.

- (a) Calculate the volume of the swimming pool.
- (b) Uncle Jared has to paint the inner surface of the pool. Given that 1 litre of paint can cover 5 m^2 , how many litres of paint does he require?
- (b) The paint is sold in 4-litre containers. Find the least number of containers of paint that Uncle Jared needs to buy.

Ans: (a) _____ m^3 [1]

(b) _____ litres [3]

(c) _____ [1]

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(b) $\sqrt{2}$	B1
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5 (a) 180 m/min	B1
(b) 300 cm/s	B1

6. $C = F^2 + \frac{1}{2}pn$ $65 = 25 + \frac{1}{2}(0.4)(n)$ $40 = 0.2n$ $n = 200$	M1 A1
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7 (a) $-6rs - 24st$ $= -6s(r + 4t)$ (b) $9gh + 45h - 15 - 3g$ $= 9h(g + 5) - 3(5 + g)$ $= (g + 5)(9h - 3)$ $= 3(g + 5)(3h - 1)$	B1 M1 A1
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8 (a) $2[3p - 2(p - 2q)]$ $= 2[3p - 2p + 4q]$ $= 6p - 4p + 8q$ $= 2p + 8q$	M1 A1
(b) $5ab + a - 3b + 2a - 4b + ba$ $= 6ab + 3a - 7b$	M1

$10 - 7ab - (6ab + 3a - 7b)$ $= 10 - 7ab - 6ab - 3a + 7b$ $= 10 - 13ab - 3a + 7b$	M1 A1
9(a) $x + 2$ $2x + 2x + 4 + x + 2 = 121$ $5x + 6 = 121$ (b) $5x = 115$ $x = 23$ Therefore, Hafiz has $2(23) + 4 = 50$ books	B1 M1 A1
$x + 10 + 3x - 30 = 180$ 10. $4x - 20 = 180$ $4x = 200$ $x = 50$	M1 A1
$7x + 3x = 180$ 11. (a) $10x = 180$ $x = 18$ $3(18) + 3(18) + y = 180$ (b) $y = 180 - 54 - 54$ $y = 72$	M1 A1 B1
12. (a) 59 (b) $6n - 1$	B1 B1
13 (a) 70% ---- \$285	M1

$100\% \text{ ---- } \frac{285}{70} \times 100$ $= \$407.10$ (b) $\$650\,000 - \$500\,000 = \$150\,000$ $\frac{150000}{500000} \times 100\% = 30\%$	A1 M1 A1
14. 1 unit = \$20 9 units = \$180	M1 A1
15 (a) $\frac{7}{8}$ (b) 48 children ---- 360° $6 \text{ children ---- } \frac{360}{48} \times 6$ $= 45^\circ$ (c) $\frac{30}{48} \times 100\%$ $= 62.5\%$	B1 M1 A1 B1
16(a) A (-2, 2) B (1, 3) (b) Trapezium	B1 B1 B1

<p>(c) $\frac{1}{2}(2+5) \times 3 = 10.5$ square units</p> <p>(d) $\frac{3-2}{1-(-2)} = \frac{1}{3}$</p>	
<p>17 (a) Area of two semi circles = $3.14 \times 5 \times 5$ $= 78.5 \text{ cm}^2$</p> <p>Total area = $100 + 78.5 = 178.5 \text{ cm}^2$</p> <p>(b) Circumference of two semi circles $= 3.14 \times 10$ $= 31.4 \text{ cm}$ Perimeter = $31.4 + 10 + 10 = 51.4 \text{ cm}$</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>
<p>18. (a) Vol = $1.5 \times 5 \times 3.5 = 26.25 \text{ m}^3$</p> <p>(b) Surface area of the pool $= (2 \times 1.5 \times 5) + (2 \times 1.5 \times 3.5) + (5 \times 3.5)$ $= 43 \text{ m}^2$</p> <p>$5 \text{ m}^2 \text{ ---- } 1 \text{ litre}$ $43 \text{ m}^2 \text{ ---- } 8.6 \text{ litres}$</p> <p>(c) 3 tins</p>	<p>B1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>B1</p>