Class:	Candidate Name:	Candidate Index Number:

SHUQUN SECONDARY SCHOOL

2011 End-of-Year Examination
Secondary 1 Express

MATHEMATICS

Paper 1 — 10 October 2011

Candidates answer on the Question Paper — **1 Hour 30 Minutes**

INSTRUCTIONS TO CANDIDATES

Write your name, class and class index number in the spaces at the top of this page and all the work you hand in.
Write in 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.

If working is needed for any question, it must be shown with the answer.
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 either your calculator value or 3.142, unless the question requires the answer in terms of π.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The total of marks for this paper is **50**.

This question paper consists of **10** printed pages.

[Turn over

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Answer **all** questions.

1. Evaluate

   a) $\frac{\sqrt[3]{128-3}}{5^3}$,

   b) $6^2 + \sqrt{9} \times 1.6$.

Ans: a) _____ [1]

b) _____ [1]

---

2. Write down the next term for each sequence.

   a) 1, 5, 11, 19, 29, ____ ,

   b) -1, -4, -9, -16, ____ .

Ans: a) _____ [1]

b) _____ [1]

---

3. If $p : q = 5 : 3$ and $p : r = 2 : 7$, find $p : q : r$.

Ans: _____ [2]

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4. Arrange the following numbers in ascending order.

a) $9, 7, -5, -7$

b) $\frac{21}{50}$, $0.\dot{4}$, 0.44, 47%

Ans: a) _____ [1]

b) _____ [1]

---

5. The temperature in a town in a day at noon was 37 °C. The temperature drops to –3 °C at midnight. Find

a) the difference between the two temperatures,

b) the temperature which is exactly half-way between the two temperatures.

Ans: a) _____ °C [1]

b) _____ °C [1]

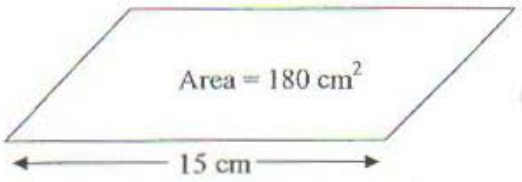
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6. Sharafi worked part time in a fast food restaurant and was paid $22.80 for 4 hours. During the December holidays, he worked 128 hours. How much did he earn during the December holidays?

Ans: $_____ [2]

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7. The diagram below shows a parallelogram with an area of 180 cm^2 and base 15 cm long. Calculate the height of the parallelogram.



Ans: _____ cm [2]

8. A gift shop uses 1155 boxes of chocolates, 462 bottles of wine and 693 tins of cookies to make as many gift hampers as possible. Each hamper has the same number of boxes of chocolates, the same number of bottles of wine and the same number of tins of cookies. What is the greatest number of gift hampers that can be made?

Ans: _____ [3]

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9. A regular polygon has n sides. The size of each interior angle is seven times the size of each exterior angle.

   a) Find the size of each exterior angle.

   b) Calculate the value of n.

Ans: a) _____ [1]

b) _____ [2]

---

10. Given that $-5 \leq x \leq -2$ and $1 \leq y \leq 4$, find

   a) the greatest possible value of $x + y$,

   b) the greatest possible value of $(x - y)^2$,

   c) the smallest possible value of $\frac{x}{y}$.

Ans: a) _____ [1]

b) _____ [1]

c) _____ [1]

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11. Factorise

a) $2r^2 + 6rh$,

b) $ac - 3c + 2ab - 6b$.

Ans: a) _____ [1]

b) _____ [2]

12. Solve the inequalities

a) $3y \leq 14$,

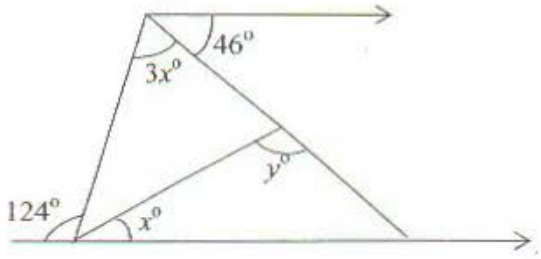
b) $\frac{2}{3}x - 3 > \frac{1}{3}x - \frac{7}{10}$.

Ans: a) _____ [1]

b) _____ [2]

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13. Calculate the values of x and y in the following diagram.



Ans: a) x = _____ [2]

b) y = _____ [2]

14. Solve the following equations

a) $2x - 7 = -2(x - 2)$.

b) $3(4a + 5) = 0.5a$.

Ans: a) x = _____ [2]

b) a = _____ [2]

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15. The following is a receipt of Sean's dinner at Lay Garden's Restaurant.

a) Calculate the amount of service charge.

b) The GST is taxed on the sum of **(I)** and **(II)** of the receipt. Calculate the amount of GST incurred.

c) Hence, find the Grand Total which Sean has to pay.

Lay Garden's Retaurant

Items	Price	
1 Fish and Chips	$19.80	
1 Fruits Salad	$8.90	
1 Cola drink	$2.50	
Total	$31.20	**(I)**
10% Service Charge	.....	**(II)**
7 % GST	.....	
Grand Total	.....	

Ans: a) $_____ [1]

b) $_____ [2]

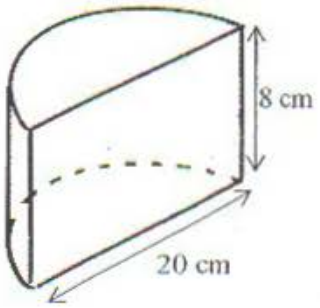
c) $_____ [1]

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16. The following diagram shows a solid that takes a shape of half a cylinder of diameter 20 cm and height 8 cm. Calculate

a) the volume of the solid,

b) the total surface area of the solid.



Ans: a) _____ cm^3 [2]

b) _____ cm^2 [2]

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17. In the space below,

a) construct a triangle PQR in which PQ = 8 cm, PR = 10 cm and $\angle QPR = 75°$, [3]

b) construct the perpendicular bisector of PQ, [1]

c) construct the angle bisector of $\angle PQR$. [1]

End of Paper

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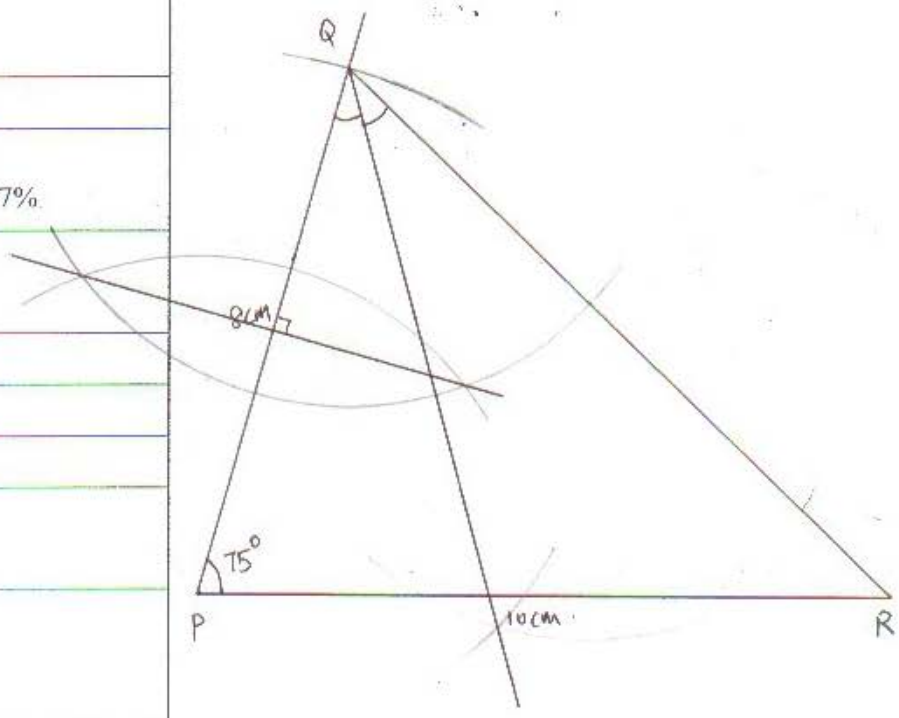
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Answers

1a.	0.04
b.	40.8
2a.	41
b.	-25
3.	10 : 6 : 35
4a.	-7, -5, 7, 9
b.	21/50, 0.44, 0.4, 47%
5a.	40
b.	17
6.	$729.60
7.	12
8.	231
9a.	22.5°
b.	16
10a.	2
b.	81
c.	-5
11a.	2r(r + 3h)
b.	(a-3)(c+2b)
12a.	4.67
b.	6.9
13a.	26
b.	108
14a.	2.75
b.	-1.30
15a.	$3.12
b.	$2.40
c.	$36.72
16a.	1256.8
b.	725.56

17.



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SHUQUN SECONDARY SCHOOL

2011 End-of-Year Examination
Secondary 1 Express

MATHEMATICS

Paper 2

11 October 2011

1 Hour 30 Minutes

Additional Material: Answer Paper
Graph Paper

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Answer **all** questions.

1. a) Express, correct to two significant figures,

   i) 208.897 [1]

   ii) 0.020859 [1]

   b) Hence estimate, correct to one significant figure, the value of $\frac{(208.897)^2}{0.020859}$. [1]

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2. a) Express 180 and 792 as a product of prime factors. Leave your answers in index notation. [2]

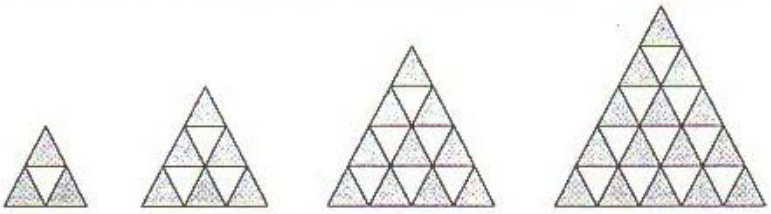
   b) Hence, find

   i) the LCM of 180 and 792, [1]

   ii) the least value of n such that $792n$ is a perfect cube. [1]

---

3. Study the sequence of shaded and unshaded triangles in the diagram below.



   a) The information from the pattern sequence is tabulated below.
   Find the values of x and y. [2]

Pattern (n)	1	2	3	4	5	6
Total number of triangles (T)	4	9	16	25	x	y

   b) Write down an expression in terms of n, for the total number of triangles in the nth pattern. [1]

   c) Hence, find the number of triangles when $n = 25$. [1]

   d) Find the value of n when the pattern is made up of 400 triangles. [1]

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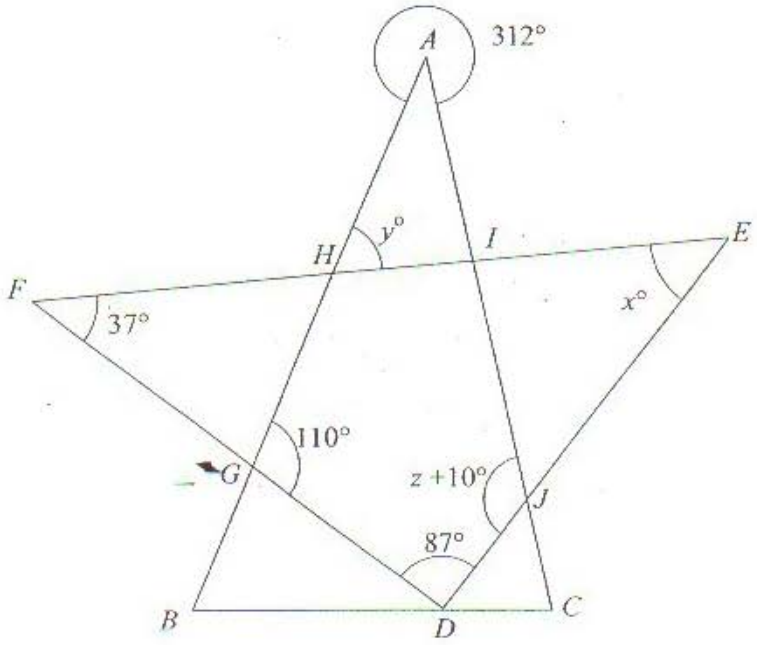
4. In the diagram, *BDC*, *AHGB*, *AIJC*, *FHIE*, *EJD and FGD* are straight lines.

Calculate the value of

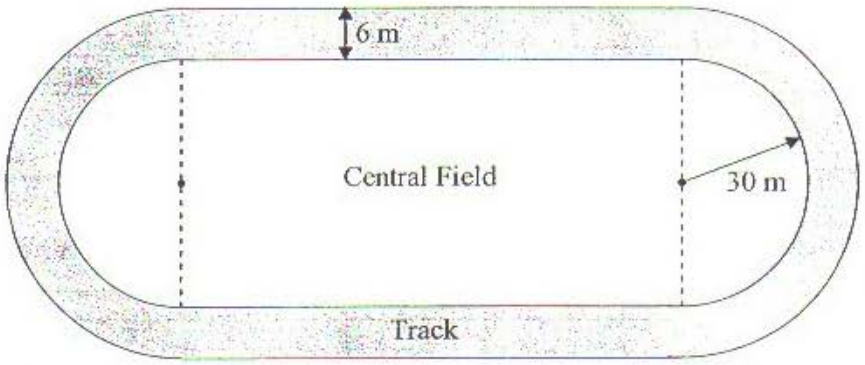
a) x, [1]

b) y, [2]

c) z. [2]



5. A track and field stadium consists of a central field surrounded by a 6 m wide running track (shaded region). The central field has two semicircular ends, each with radius 30 m and two straight sides. The perimeter of the central field is 350 m.



Find

a) the length of each straight side of the central field, [2]

b) the area of the central field, [2]

c) the area of the running track. [2]

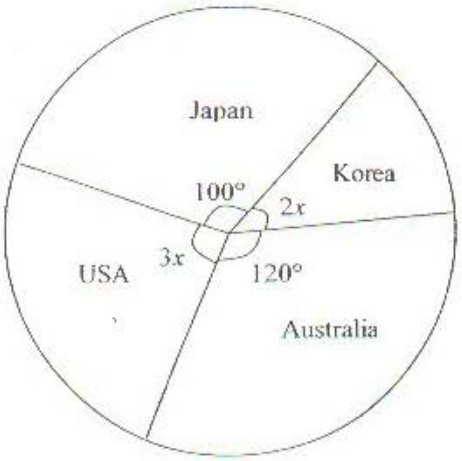
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6. a) Express $\frac{3}{x+2} - \frac{4}{x-1}$ as a single fraction in its lowest term. [3]

b) Solve $\frac{2}{x-1} = \frac{3}{2x+1}$. [3]

---

7. A group of students were surveyed to determine which countries they would like to visit the most. Their choices were represented on a pie chart as given below. →



a) Find the value of x. [2]

b) Hence, calculate the percentage of the group who would like to visit Korea the most. [2]

c) If 400 students would like to visit Australia the most, find the total number of students surveyed. [2]

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8. a) An aircraft flew a distance of 8756 km from London to Los Angeles at an average speed of v km/h. Write down the expression for the time in hours that it took for the journey. [1]

b) The aircraft returned non-stop by the same route at an average speed of $3v$ km/h. Write down the expression for the time in hours that it took for the return journey. [1]

c) Given that the difference between these two times was 15 hours, form an equation in v. Show that the equation will reduce to $17512 = 45v$. [2]

d) Hence, solve this equation. [1]

e) Thus, find the time in hours the aircraft took on the return journey. [1]

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

The table of values for the linear function $y = -3x + 2$ is given below.

x	-4	-2	0	2	4
$y = -3x + 2$	14	a	2	-4	-10

a) Find the value of a. [1]

b) Using a scale of 2 cm to represent 1 unit on the x-axis and 1 cm to represent 1 unit on the y-axis, draw the graph of $y = -3x + 2$ for the values of x from -4 to 4. [3]

c) From the graph, find the value of x when $y = 3$. [1]

d) Draw the line $y = 8$ and state the gradient. [2]

e) Find the coordinates of the point when the two graphs intersect. [1]

f) Find the gradient of the line AB where A is (1 , 6) and B is (–2 , –4). [1]

End of Paper

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Answers

1ai.	210
ii.	0.021
b.	2000 000
2a.	$2^2 \times 3^2 \times 5$, $2^3 \times 3^2 \times 11$
bi.	3960
ii.	363
3a.	36, 49
b.	$(n + 1)^2$
c.	676
d.	19
4a.	56
b.	73
c.	105
5a.	80.74
b.	7672.2
c.	2213.112
6a.	$(-11 - x)/[(x + 2)(x - 1)]$
b.	$X = -5$
7a.	28
b.	15.6%
c.	1200
8a.	8756/v
b.	8756/3v
c.	8756/v - 8756/3v = 15
d.	389
e.	7.50h
9a.	a = 8
b.	graph
c.	-0.3
d.	0
e.	(-2 , 8)
f.	3.33

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