Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Identity no: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Seat No: \_\_\_\_\_\_\_\_\_

BCA ACADEMY

SCHOOL OF BUILDING & DEVELOPMENT

# SINGAPORE

**MATHEMATICS SCREENING TEST**

**Set C**

## 1.5 HOURS

**Instructions to candidates**

# Do not turn over this page until you are told to do so.

# Check that you have the correct exam paper, number of pages and questions.

1. This paper consists of **TEN (10)** questions (100 marks). Answer ALL questions
2. Write your **Name, IC No. and Seat No.** on this cover page.
3. All answers are to be written in THIS booklet.
4. Do **NOT** tear out any page. This booklet is the property of BCA Academy and **must not be removed** from the test centre.
5. Mobile phones are to be switched off and electronic equipments are not allowed to be used.
6. Candidates are to bring their own non-programmable scientific calculator.
* Unless otherwise stated, leave your answers in 3 significant figures.
* Unless the questions require the answers in term of$ π$, the calculator value for $π=3.142$ should be used.
* If working is needed for any question, it must be shown with the answer. Omission of essential working will result in loss of marks.

|  |  |  |  |
| --- | --- | --- | --- |
| For Official Use: | Test Centre: | Test Date: | Marks( /100): |
| Marker: | Checker: |

1. Simplify the following expressions using **fractions only**. Show your working clearly.

(a)  (5 marks)

(b)  (5 marks)

1. Solve the following expressions:
2.  (6 marks)
3. $9×3^{2x-1}=\frac{1}{27}$ (4 marks)
4. (a) A sum of money is divided among three students, Angel, Bryan and Colin in the ratio of 5:7:2. Angel has $36 less than Bryan.
	1. How much does Colin has.
	2. If Bryan spent $25 on cakes, how much money does he left with.

(5 marks)

 (b) A map has a scale of 1:100,000.

(i) In the map the distance between 2 places is 15 cm apart. What is the actual distance, in km. (2 marks)

(ii) The actual area of a garden is 52 km2. Find the area, in cm2, represented in the map. (3 marks)

1. (a) Given that triangle *ABC* in the figure below is an equilateral triangle and $∠CDE$ is right angle. Find the value of *x*. (2 marks)



*x*

(b) If $∠OBC$ is 55°, what is the angle BAC? (3 marks)



1. The tangents to the circle at point *B* and *C* meet at *A*.
	1. Calculate the angle $∠AOC$. (2 marks)
	2. Show that B, O and P lie on a straight line. (3 marks)

120°

*O*

*A*

*B*

*C*

*P*

1. The diagram shows a circle *PQRS* with centre *O*. *POT* is **NOT** a straight line. Calculate the following angles.

 (i) $∠PRT$ (3 marks)

 (ii) $∠PQR$ (4 marks)

 (iii) $∠POT$ (3 marks)

*O*

*Q*

*R*

*T*

*S*

*P*

23°

47°

1. (a) In the diagram below, AB is parallel to EDC. AE is 12 metres in length. $∠AEC$ is 55° and $∠BEC$ is 68°. Find the length of AB. (6 marks)

?

68°

55°

D

E

C

12 m

A

B

1. In the box shown below, find
	* 1. the length of PV, PR and RV; and (1 mark)
		2. the angle . (3 marks)

5 cm

6 cm

3 cm cm

R

S

P

U

V

1. Find the value of *x* and *y* in the following equation:

$\left(\begin{matrix}x&-3\\-2&1\end{matrix}\right)\left(\begin{matrix}6&y\\3&0\end{matrix}\right)=\left(\begin{matrix}1-5y&-20\\-9&3x-7\end{matrix}\right)$ (10 marks)

1. In the diagram, ABCD is a parallelogram. F is the point on BC such that BC = 4BF. G is the point on BE such that GE = 2BG. = 2**p**, =**q**.

A

D

***q***



E

G

B

C

F

2***p***

Express, as simply as possible, in terms of **p** and **q**,

1. , (1 mark)
2. , (1 mark)
3. , (2 marks)
4. , (3 marks)
5. . (3 marks)
6. Two Mathematics books, three Chemistry books and four Physics books are to be arranged in a row on a shelf. Given that all the books are different, find the number of ways of arranging the books if
7. there are no restrictions; (2 marks)
8. books of the same subject are placed together; (2 marks)
9. a Chemistry book is placed at each of the two ends of the row; (2 marks)
10. no two Physics books are placed together. (4 marks)
11. (a) Given that  . Express the following, in the simplest form, in terms of .
12.  (3 marks)
13.  (3 marks)
14. The function *f* is defined by $f\left(x\right)=4x-a$

The function *g* is defined by *g ( x) = x − 7*

1. Find the value of *a* given that $f^{-1}\left(-16\right)=4$ (2 marks)
2. Find the value of *fg(10)* (2 marks)

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**END OF PAPER**