

HONG KONG INSTITUTE OF VOCATIONAL EDUCATION
FOUNDATION COURSES EXAMINATION

Course : Foundation Certificate/BCTT **Course Code** : 03601T/1,03602
05601B,T/1

Stream : Business/Technical

Module Title : Mathematics

Module Code : CMV6103

Session : 2000/2001

Date : 12 June 2001

Time Allowed: 2 hours

Time : 7:00 to 9:00 p.m.

This examination paper has 7 pages (excluding this covering page).

Instructions to Candidates :

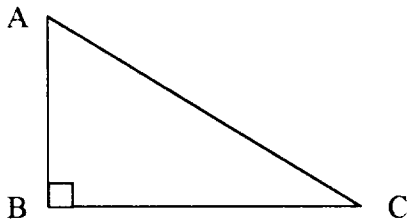
1. Answer ALL questions in section A (10 multiple choice questions). Each question carries 2 marks. (20 marks)
2. Answer ALL questions in section B (7 short questions). Each question carries 5 marks. (35 marks)
3. Answer ANY 3 questions out of 5 in section C (long questions). Each question carries 15 marks. (45 marks)
4. Multiple choice **answer sheet** is provided for section A. Answers of section B and C must be written in the answer book provided.
5. Approved calculators may be used.

Section B Short Questions (35 marks)

Answer ALL questions in this section. Each question carries 5 marks.

B1. In the figure below, $\angle ABC = 90^\circ$, $AB = 5$ cm and $\cos C = \frac{1}{3}$.

- (a) Find $\angle ACB$. [Answer correct to 1 decimal place]
 (b) Calculate the length of AC. [Answer correct to 2 decimal places]



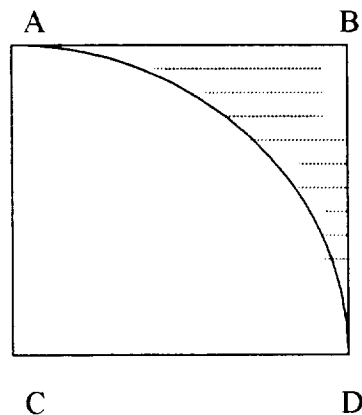
B2. Find the equation of a circle with its centre at (1,-3) and radius 2 units.

Express your answer in the form $x^2 + y^2 + ax + by + c = 0$.

B3. Solve the inequality $-7 < 2x^2 - 15x$.

B4. In the figure below, ABCD is a square measures 12 m x 12 m. ACD is a quadrant of a circle with C as its centre. Find the area of the shaded portion.

[Answer correct to 1 decimal place]



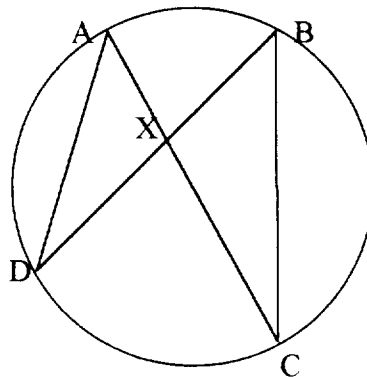
B5. Given $x : (y - 1) = 3 : 4$.

- (a) Express x in terms of y .
- (b) If $2x + y = 21$, find the values of x and y .

B6. There are 2 blue books, 4 green books and 6 red books in a book shelf.

- (a) A book is drawn at random from the shelf, what is the probability that the book is red?
- (b) Two books are drawn at random from the shelf without replacement, what is the probability that the first book is blue and the second book is green?

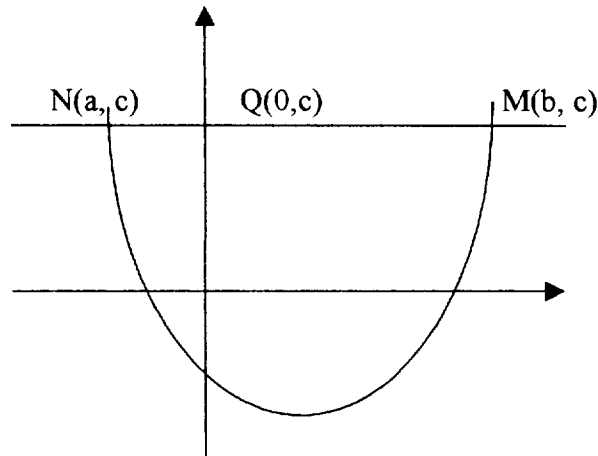
B7. In the figure below, $ABCD$ is a cyclic quadrilateral. $\angle BXC$ equals 101° and $\angle ADX$ equals 31° . Find $\angle CBX$.



Section C Long Questions (45 marks)

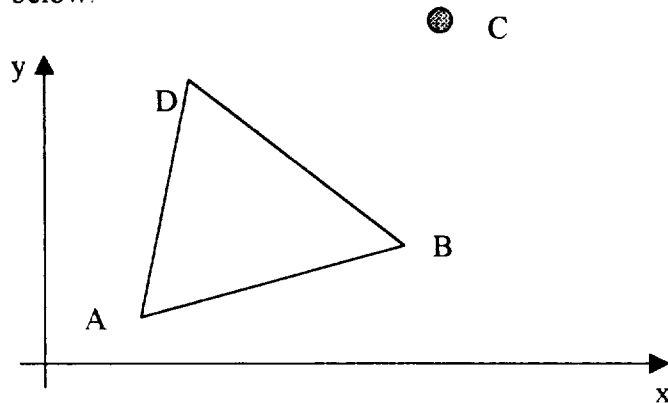
Answer ANY THREE questions in this section. Each question carries 15 marks.

- C1. In the figure below, the curve $y = x^2 - 4x + 3$ cuts the line $y = c$ at the points $N(a, c)$ and $M(b, c)$.



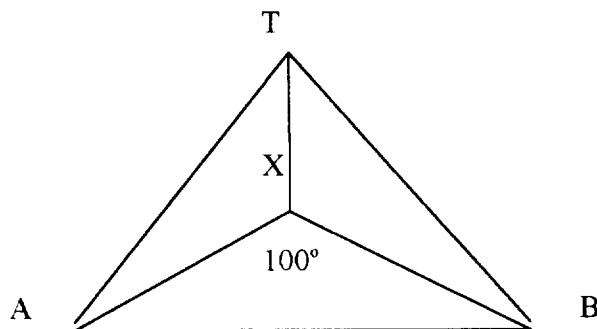
- (a) Find the value of $a + b$.
[Hint: $y = x^2 - 4x + 3 = c$ when $x = a$ or b] (2 marks)
- (b) Express ab in terms of c . (2 marks)
- (c) Find the value of c if $a = b$. (5 marks)
- (d) Find the value of c if $MQ = 2NQ$. (6 marks)
- C2. (a) The length of 5 metal bars are in geometric progression with common ratio R where $R > 1$. The shortest one has length a .
- Write down the length of the longest bar in terms of a and R .
 - Find the total length of all the bars in terms of a and R . (3 marks)
- (b) Joey is considering to join a saving program of ABC bank. Joey would deposit \$5,000 on the first day of each month for five consecutive months and ABC bank agreed to pay interest at a rate of 1% per month.
- Calculate the accrued amount (total deposit plus any interest earned) of Joey in ABC bank at the end of 2 months.
 - Find the accrued amount of Joey at the end of five consecutive months.
- [Answers correct to the nearest dollar] (12 marks)

- C3. The points A(1, 1), B(5, 2) and D(2, 4) form the vertices of a triangle as shown below.



- (a) Show that $\triangle ABD$ is **NOT** an isosceles triangle. (4 marks)
- (b) Find the equation of the line joining AB. (3 marks)
- (c) Find the equation of the line joining AD. (3 marks)
- (d) If C is the point (6,5), show that ABCD form a parallelogram. (5 marks)

- C4. A vertical tower TX of height 290 m is constructed at a horizontal site such that $AX = 100$ m, $BX = 110$ m and $\angle AXB = 100^\circ$.



- (a) Find the angle of elevation of T from B. (3 marks)
- (b) A cable is to be placed between T and A. What is the minimum length of the cable? (2 marks)
- (c) Find the length of AB. (4 marks)
- (d) $\triangle AXB$ is to be transformed into a garden, find the area of the garden. [Answer correct to 2 decimal places] (4 marks)
- (e) The cost of building a garden is \$12 per m^2 , calculate the cost of building the garden. [Answer correct to the nearest dollar] (2 marks)

C5. The frequency distribution of the weight of 90 sheep is as follows:

weight/kg	Frequency
20 to 29	5
30 to 39	21
40 to 49	24
50 to 59	31
60 to 69	9

- (a) Draw a pie chart for the distribution of height. Show all the relevant angles.
(6 marks)
- (b) By completing the table below, construct a cumulative frequency polygon for the distribution.
(5 marks)

weight up to /kg	cumulative frequency
19.5	
29.5	
39.5	
49.5	
59.5	
69.5	

- (c) Read from your cumulative frequency polygon the median of the distribution.
(2 marks)
- (d) If sheep of weight less than 45 kg are to be selected for special rearing, how many sheep would be selected?
(2 marks)

*** END OF PAPER ***