

CHRIST CHURCH FOUNDATION SCHOOL

PROMOTION EXAMINATION JUNE 2009

MATHEMATICS PAPER II

THIRD FORMS

DURATION: 2 h

Answer ALL questions in Section 1, and any TWO in Section II

Foolscap and graph paper are provided.

Calculators may be used for this paper.

Full marks may NOT be awarded unless working is shown.

Answer **ALL** of the questions in section I and any **TWO** questions from section II.
Full marks may not be awarded unless full working or explanation is shown with the answer.

SECTION I

1. (a) Calculate the value of
 $\frac{2}{3} - 2\frac{1}{2} \div 4$, giving your answer
(i) as a fraction in its lowest terms,
(ii) as a decimal correct to 2 **significant figures**,
(iii) in standard form. [5]
- (b) Given that $m * n = m + 3n$
Evaluate (i) $1 * 2$
(ii) $3 * (1 * 2)$ [3]
- (c) Given that EC \$1.00 = BDS \$0.78.
(i) Convert EC \$ 750 to Barbadian currency. [2]
(ii) How many EC dollars would one get for BDS \$390? [2]
2. (a) Given that $a = -3$, $b = 6$ and $c = -1$, calculate the value of
 $\frac{2a^2 - ab}{a + c}$. [3]
- (b) Simplify $\frac{x}{2y} - \frac{2x}{3y}$. [2]
- (c) Solve simultaneously
 $x + 2y = 40$
 $3x + y = 60$ [4]
3. (a) The marked price of a living room suite was \$6 500. If Mr. Wright buys the suite for cash, he receives a discount of 14%.
(i) Calculate the price Mr. Wright paid if bought the suite for cash.

If Mr. Wright buys on hire purchase, he must make a down payment of \$1 200 and pay 24 equal monthly instalments of \$307.50
(ii) Calculate the hire purchase price

- (iii) Calculate the amount Mr. Wright saves by buying the suite for cash instead of on hire purchase.
 - (iv) Express this saving as a percentage of the **marked price**. [7]
- (b) Calculate the difference between the compound interest and simple interest on \$60 000 for 3 years at 9% per annum. [5]

4. Triangle ABC, with vertices A(4, 1), B(2, 1) and C(4, 3), is enlarged by a scale factor of 2, with the origin, (0, 0) as centre of enlargement. The image of triangle ABC is A'B'C'.

- (i) On graph paper, using a scale of 1 cm to 1 unit on each axis, draw and label clearly triangle ABC and triangle A'B'C'. [5]

Triangle ABC is rotated through 180° about centre (2, 1) to form triangle A''B''C''.

- (ii) Draw, on the same axes, the graph of A''B''C'' and write down the co-ordinates of A'' and of C''. [4]

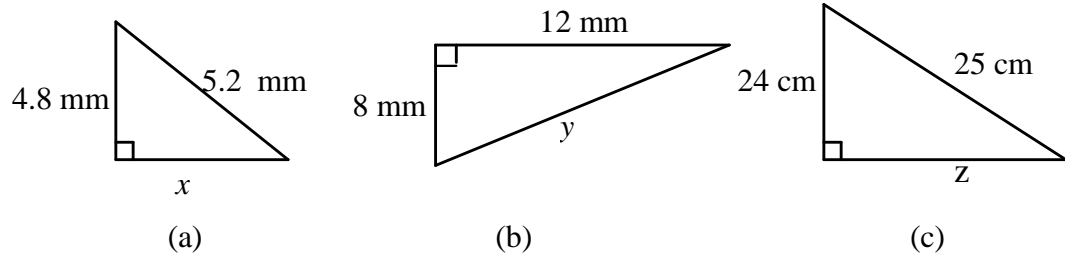
5. In a survey of 10 households, the number of children per household was found to be

3, 1, 5, 6, 3, 8, 2, 7, 5, 3

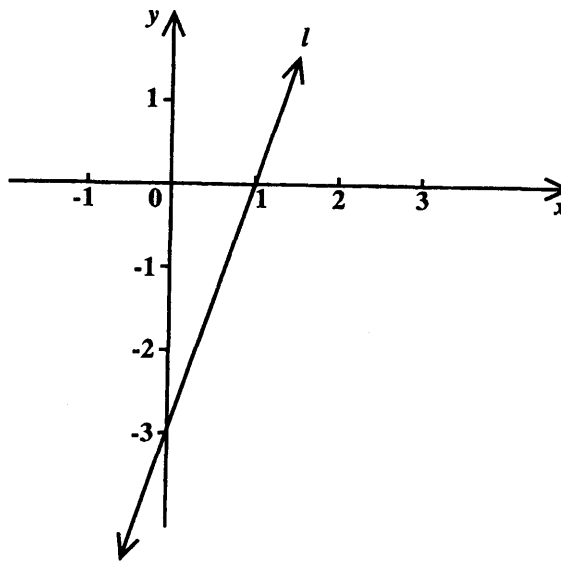
- (a) State the mode. (1 mark)
- (b) Calculate
 - (i) the mean number of children per household
 - (ii) the median number of children per household. (5 marks)
- (c) Calculate the probability that a household chosen at random from those in the survey would have
 - (i) exactly 4 children
 - (ii) more than 4 children. (4 marks)

Total 10 marks

6.. Calculate the value of the unknown side marked in each of the following diagrams which are not drawn to scale:



7. (a)



The diagram above, **not drawn to scale**, shows the straight line, l , which cuts the x -axis at $(1, 0)$ and the y -axis at $(0, -3)$.

- (i) Determine the gradient of the line, l
- (ii) Write down the equation of the line, l , in the form $y = mx + c$.

(b) Copy and complete the table for the function $y = x^2 + 2x - 3$.

x	-4	-3	-2	-1	0	1	2	3
y	5	0	-3					12

[2]

Using the answer sheet provided, draw on the same axes the graph of the function $y = x^2 + 2x - 3$.

[3]

- (c) Using the graphs, mark and state
 - (i) the **solutions** of the equation $x^2 + 2x - 3 = 0$.

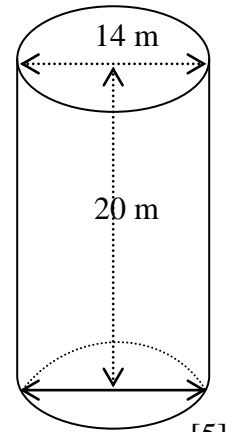
- (ii) the co-ordinates of the **points** where AB cuts the curve $y = x^2 + 2x - 3$. [4]

8. (a) The diagram on the right, **not drawn to scale**, represents a cylindrical tank. Inside the tank, the height is 20 m and the diameter of the tank is 14 m.

- (i) Calculate, in **square centimetres**, the area of the bottom of the tank. (Use $\pi = \frac{22}{7}$)

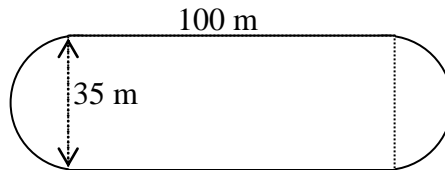
Given that $1000 \text{ cm}^3 = 1 \text{ litre}$,

- (ii) calculate the volume of water, in **litres** that the tank can hold, $V = \pi r^2 h$



[5]

- (b) Calculate (i) the perimeter and (ii) the area of the playing field below.



[5]

SECTION II

Answer any **TWO** questions.

9. (a) Mary bought three tapes and four compact discs for \$270. Jane bought six of the same tapes and five of the same compact discs for \$450.
- (i) Using x to represent the cost, in dollars, of a tape and y to represent the cost, in dollars, of a compact disc, write **TWO** equations in x and y to represent the information above.
- (ii) Hence, calculate the cost of a tape and of a compact disc. [6]
- (b) The volume, V , of a fixed mass of gas varies directly as the temperature, T , measured in Kelvin (K). If $V = 500 \text{ cm}^3$ when $T = 300 \text{ K}$, calculate
- (i) V when $T = 450 \text{ K}$ (ii) T when $V = 625 \text{ cm}^3$. [5]

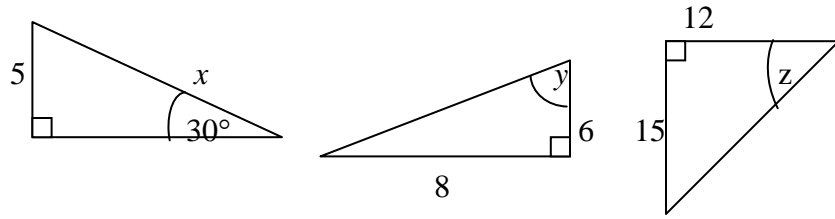
10. The graph on the right shows the number of children in 30 randomly chosen families.

- (a) Using the graph, copy and complete the table below

Children in the Family	Frequency
0	
1	
2	
3	
4	
5	

- (b) Determine the mode, median and mean of the distribution. [3]
- (c) Calculate the probability that a child chosen at random, comes from a family with at least 4 children. [6]
- [2]

11. (a) Calculate the value of the unknown side or angle in the following triangles.



[3,2,2]

- (b) From the top of a vertical cliff over looking the sea, the angle of depression of a boat is 58° . If the horizontal distance from the boat to the foot of the cliff is 400 m.
- Draw a sketch to represent the information given.
 - Calculate the height of the cliff.

[4]

**CHRIST CHURCH FOUNDATION SCHOOL
PROMOTION EXAMINATION JUNE 1999
MATHEMATICS**

Paper I - Multiple Choice & Short Answer

Third Forms

1½ Hours

1. Use the answer sheet provided when answering these questions.
2. This paper consists of 20 multiple choice questions and 9 short answer, ALL of which must be attempted.
3. Each multiple choice item on the paper has four suggested answers lettered
4. (A), (B), (C), (D). Read each question carefully and decide which is the best answer.
4. On the answer sheet provided, find the correct number and SHADE the letter corresponding to your choice.
5. Use **pencils** only in shading your choice.
6. If you want to change an answer, make sure that you erase your old answer carefully and completely.
7. When you are told to begin, work quietly and carefully. If you cannot answer an item, omit it on the answer sheet and go on to the next one. You can return to the item later. There is no penalty for guessing.
8. You should not leave any questions unanswered.
9. Figures are not necessarily drawn to scale.
10. Calculators or mathematical tables must not be used in this exam

1. The value of $(-1)^3 + (-1)^2$ is

- (A) 2 (B) 1
(C) 0 (D) -2

2. The numbers $\frac{1}{3}$, 33%, 0.303, $\frac{3}{8}$ arranged in descending order is

- (A) $\frac{3}{8}$, $\frac{1}{3}$, 33%, 0.303
(B) $\frac{3}{8}$, 33%, $\frac{1}{3}$, 0.303
(C) 33%, $\frac{3}{8}$, $\frac{1}{3}$, 0.303
(D) 0.303, 33%, $\frac{1}{3}$, $\frac{3}{8}$

3. $\frac{3}{5x} + \frac{7}{5x} =$

- (A) $\frac{21}{25x}$ (B) $\frac{10}{x}$
(C) $\frac{2}{x}$ (D) 2

4. A letter is chosen at random from the letters in the word "EXAMINATIONS". The probability of obtaining an "A" is

- (A) $\frac{1}{12}$ (B) $\frac{1}{6}$
(C) $\frac{1}{9}$ (D) $\frac{2}{11}$

5. A vendor buys 5 dozen T-shirts at \$240 per dozen. He then sells them at \$25 each. His percentage profit is

- (A) 80% (B) 25%
(C) 20% (D) 5%

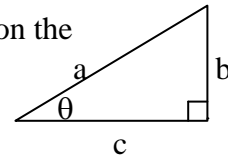
6. If y varies inversely as x and $y = 5$ when $x = 4$, the value of x when $y = 2$ is

- (A) 2.5 (B) 8
(C) 10 (D) 20

7. If \$96 is divided in the ratio 5:4:3, the middle share is

- (A) \$8 (B) \$24
(C) \$32 (D) \$40

8. From the figure on the right, $\sin \theta =$



- (A) $\frac{b}{a}$ (B) $\frac{b}{c}$
(C) $\frac{c}{a}$ (D) $\frac{a}{c}$

9. The graph of the line $y = 3x - 4$ passes through the point

- (A) $(-4, 0)$ (B) $(0, 3)$
(C) $(0, -4)$ (D) $(3, 0)$

10. The image of the point $(2, 3)$ under a reflection in the line $y = x$ is

- (A) $(2, 3)$ (B) $(-2, 3)$
(C) $(2, -3)$ (D) $(3, 2)$

11. On average a woman spends \$600 on Rent, \$400 on Food and \$200 on Clothes and Cosmetics per month. The angle on a pie chart representing Food would be

- (A) 33° (B) 40°
(C) 90° (D) 120°

12. A salesman is paid 5% of the day's sales as commission. A day's sales amounted to \$2020. How much commission did he get?

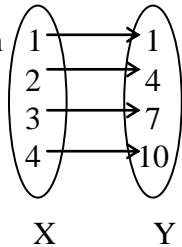
- (A) \$ 11.00 (B) \$ 20.20
(C) \$101.00 (D) \$110.00

13. The perimeter of a square whose area is 625 cm^2 is

- (A) 125 cm (B) 100 cm
(C) 50 cm (D) 25 cm

14. The arrow diagram represents the relation

- (A) $x \rightarrow 2x - 1$
(B) $x \rightarrow x + 2$
(C) $x \rightarrow x^2$
(D) $x \rightarrow 3x - 2$



15. A woman buys a pair of shoes at a sale. She pays \$60, saving \$15 on the original price. The percentage discount on the shoes is

- (A) 20 (B) 25
(C) $33\frac{1}{3}$ (D) 80

16. If $3 - (2 - x)$ is simplified the result is

- (A) $1 + x$ (B) $1 - x$
(C) $3x - 6$ (D) $-6 - 3x$

17. The co-ordinates of the image of the point $(3, 3)$ under a reflection in the line $x = 1$ is

- (A) $(-3, 3)$ (B) $(3, -3)$
(C) $(-1, 3)$ (D) $(3, -1)$

18. The shortest distance between the origin, O, and the point A(3, 4) is

- (A) 25 (B) 7
(C) 5 (D) 4

19. The area of a circle of radius, r is

- (A) $2\pi r^2$ (B) πr^2
(C) $2\pi r$ (D) πr

20. If $f(x) = 7 - 3x$ then $f(-2) =$

- (A) 1 (B) 2
(C) 12 (D) 13

**CHRIST CHURCH FOUNDATION SCHOOL
PROMOTION EXAMINATION JUNE 1999
MATHEMATICS I**

Name:.....

Form:.....

- | | |
|---------------------|---------------------|
| 1. (A) (B) (C) (D) | 11. (A) (B) (C) (D) |
| 2. (A) (B) (C) (D) | 12. (A) (B) (C) (D) |
| 3. (A) (B) (C) (D) | 13. (A) (B) (C) (D) |
| 4. (A) (B) (C) (D) | 14. (A) (B) (C) (D) |
| 5. (A) (B) (C) (D) | 15. (A) (B) (C) (D) |
| 6. (A) (B) (C) (D) | 16. (A) (B) (C) (D) |
| 7. (A) (B) (C) (D) | 17. (A) (B) (C) (D) |
| 8. (A) (B) (C) (D) | 18. (A) (B) (C) (D) |
| 9. (A) (B) (C) (D) | 19. (A) (B) (C) (D) |
| 10. (A) (B) (C) (D) | 20. (A) (B) (C) (D) |

SECTION II

Answer each question in this section. Put your answers on the lines provided. ALL working must be clearly shown in the spaces provided. Full marks may not be awarded unless full working or explanation is shown.

21. Calculate each of the following:

(a) $1\frac{1}{2} \div \frac{3}{4} - \frac{1}{4} \times \frac{1}{2}$ (b) $(\frac{1}{3} \times \frac{3}{4}) + (\frac{3}{8} \div \frac{1}{4})$

Ans:.....

Ans:.....

[3, 3]

22. Ann has x tamarind balls, Barry has twice as many as Ann, and Cathy has six less than Ann. Together they have 26 tamarind balls. Form an equation in x and solve it to find the value of x .

Ann has

Barry has

Cathy has

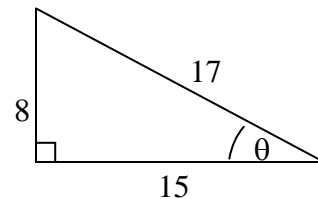
Together they have

Ans: The equation is..... Ans: $x =$ [3, 2]

23. (a) A 5 metre ladder is leaning against a vertical wall. Its foot makes an angle of 60° with the ground. Calculate how far up the wall the ladder reaches.
Note: $\sin 60^\circ = 0.866$, $\cos 60^\circ = 0.500$, $\tan 60^\circ = 1.732$

Ans: [4]

(b) Write down the value of $\tan \theta$ in decimal form using the right-angled triangle shown on the right. **Give your answer to 3 significant figures.**



Ans: $\tan \theta =$ [3]

24. (a) Eight people take 6 days to pick a field of cotton. How long would it take twelve people working at the same rate?

Ans:..... [2]

- (b) A dentist earns \$180 every 3 hours. How much will he earn in
 (i) $\frac{1}{2}$ hour (ii) 8 hours (iii) 1 minute

Ans (i):..... Ans (ii):..... Ans(iii):..... [2, 1, 2]

25. (a) A plot of land is in the shape of a right-angled triangle. If the hypotenuse is 15 m long and one of the other sides is 9 m, calculate the length of the third side.

Ans (a):..... [3]

- (b) Calculate the area of the plot of land.

Ans (b):..... [2]

26. (a) A shopkeeper paid \$25 for 40 kilograms of flour and would like to make a profit of 60%. Calculate the selling price of 1 kilogram of flour.

Ans (a):..... [3]

- (b) When VAT is charged at 15%, the VAT on an article is \$11.25. Calculate

- (i) the price of the article before the VAT is added,
 (ii) the total amount the article would cost after the VAT is added.

Ans (i):..... Ans (ii):..... [3, 2]

27. (a) Simplify $4p^3 \times 3p^4$ Ans(a): [2]

(b) If $a * b = a - 2b$, evaluate $5 * 2$. Ans(b):..... [2]

28. The table below shows the distribution of the ages of a group of students in a club.

Age	11	12	13	14	15	16
No. of children	6	3	5	4	4	3

(a) Write down [1]

(i) The number of students in the club. Ans:..... [1]

(ii) The median age. Ans:..... [1]

(iii) The modal age Ans :..... [1]

(b) Calculate
(i) the mean age of the group of students

Ans:..... [4]
(ii) the probability that a student chosen at random is **AT LEAST**
13 years old

Ans:..... [2]

29. (a) Given that the equation of a straight line is $y = 2x + c$ and that it passes through the point (3, 5), find the value of the y-intercept, c .

Ans:..... [2]

(b) A straight line passes through the points (-2, 5) and (1, -1). Calculate the gradient of the straight line.

Ans:..... [2]