



St Stephen's School Carramar

SEMESTER 1 2005

Year 10 Mathematics Development: Section A

Name: _____

Teacher: _____

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work: 10 minutes
Working time for paper: 2 hours
Marks available 120 marks

MATERIAL REQUIRED/RECOMMENDED FOR THIS PAPER

TO BE PROVIDED BY THE SUPERVISOR

Two Question Papers:	Section A – Questions 1 to 11	63 marks
	Section B – Questions 12 to 18	57 marks

TO BE PROVIDED BY THE CANDIDATE

Standard Items: pens, pencils, eraser, ruler
Special Items: Drawing instruments, templates and a maximum of 2 graphics calculators satisfying the conditions set by the Curriculum Council.
Two A4 size pages of notes.

INSTRUCTIONS TO CANDIDATES

All questions must be attempted to gain full marks.
All working should be completed with a blue pen and diagrams in pencil.
Marks are allocated for working so show ALL your working.
Enjoy, may you achieve mathematical XTC.

IMPORTANT NOTE TO CANDIDATES

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1. [4 marks]

Robert and Debbie own a business where the profits are distributed in the ratio of 3 : 5. How should the profit of \$21360 be shared?

2. [2, 3, = 5 marks]

Mr XTC can perform 2400 mathematical calculations in 3 hours and 20 minutes. (Use MC as an abbreviation for mathematical calculations)

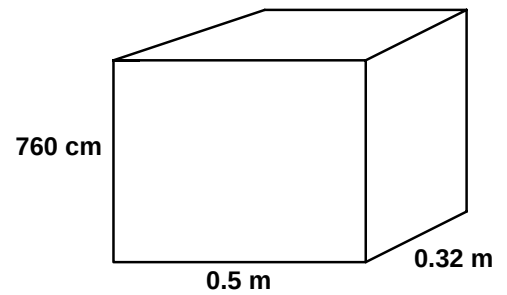
a. Express this as a simple rate

b. How long will it take Mr XTC to perform 10,620 MCs? Express your answer in hours and minutes.

3. [3, 2 = 5 marks]

If the density of plastic is 1.5 gm/cm^3 ,

- a. What is the mass of the following block of plastic?
(Express your answer in kilograms)



- b. If the block was made of a different material, that had a density 15% less than plastic, what would be the mass?
(Express your answer in kilograms)

4. [3 marks]

A real estate agent is paid \$240 per week and receives 3.5% commission on sales. Calculate his weekly pay if he sells property worth \$750,280 in that week.

5. [4 marks]

Mr Moneybags invested \$145,000 over 3 years and received a total of \$26,100 in simple interest. What annual interest rate was he receiving?

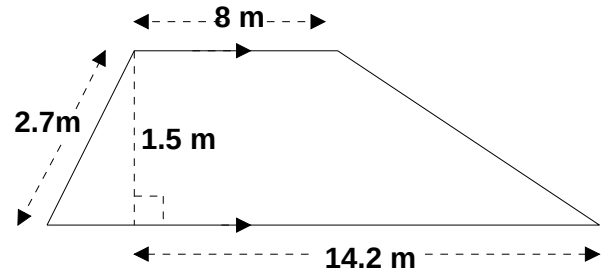
6. [5 marks]

Sneaky Sam, the moneylender lends Shirley \$15,000 at the rate of 11% per annum compounding daily. Find the amount of interest that needs to be paid in a non-leap year if the loan is paid off after 100 days.

7. [8, 2 = 10 marks]

For the following shape,

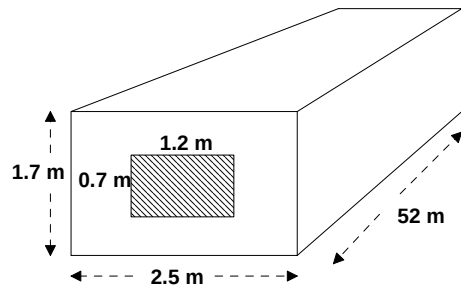
- a. Find the perimeter (accurate to 1 decimal place)



- b. Find the area (accurate to 1 decimal place)

8. [4 marks]

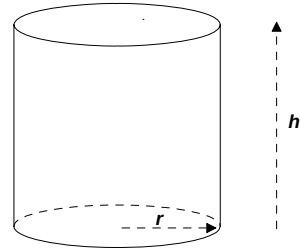
The following rectangular pipe is constructed of cement and has a hollow rectangular centre. Find the volume of cement required to make it. (accurate to 2 decimal places)



9. [2, 3, 2 = 7 marks]

A given cylinder has a height h and radius r , and has a top and bottom.

- a. Write the formula to calculate the total surface area of the cylinder



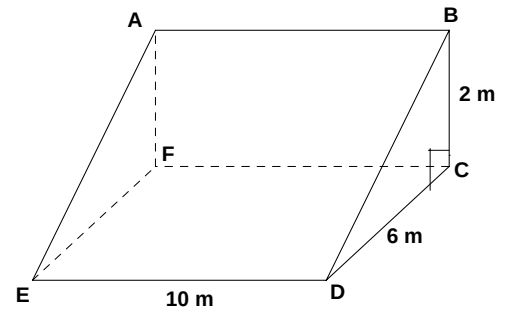
- b. Transpose the formula to make h the subject

- c. Calculate the height of a cylinder that has a total surface area of 170 m^2 and radius of 3 m . (accurate to 2 decimal places)

10. [5, 3 = 8marks]

For the following rectangular-based wedge

- a. Find the angle that the line AD makes with DF.
(accurate to 2 decimal places)



- b. Find the distance from E to B. (accurate to 2 decimal places)

11. [6, 2 = 8 marks]

Two ships P and Q leave the same port at the same time. Ship P sails on a course NE while Q sails $S 34^{\circ} E$. After two hours, both ships stopped, and P had sailed 152 km and is now due north of Q. (Hint: draw a diagram)

a. Find the distance from P to Q. (accurate to 1 decimal place)

b. How far has Q sailed? (accurate to 1 decimal place)



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12. [2, 4, 2, 4 = 12 marks]

Completely factorize the following

a. $x^2 - 12x + 36$

b. $6x^2 + 17x + 5$

c. $(m - 5)^2 - t^2$

d. $5x^2 - 5y^2 + 6x - 6y$

13. [3, 3 = 6 marks]

Solve the following equations

a. $\frac{4x - 1}{2} = \frac{7x - 3}{3}$

b. $\frac{4x - 3}{-5} > 3$

14. [2, 3 = 5 marks]

Simplify the following

a. $-pq \times 2pr^2 \times 5p^2r \times 3p^4q$

b. $\frac{3x}{x-3} - \frac{2x}{x-2}$

15. [5, 6 = 11 marks]

Simplify the following

a. $\frac{x^2 + x - 2}{x^2 - 1} \div \frac{x^2 - x - 6}{2x^2 - 18}$

b. $\left(\frac{4u^2 v^{-1}}{w^{-1} x^2} \right)^{-2} \times \left(\frac{6w^2 x^{-1}}{u^{-1} v^3} \right)^2$

16. [2, 2, 2, 2 = 8 marks]

Given the two points $(1, 2)$ and $(3, 12)$

- Find the gradient of the line that passes through these 2 points.
- Find the equation of the line that passes through these 2 points.
- Find the x- intercept of the line that passes through these 2 points.
- Find the midpoint between these two points.

17. [5 marks]

Given the line $y = 3x + 6$, determine the equation of the line that is perpendicular to the given line, and passes through the point (6, 5)

18. [4, 6 = 10 marks]

At the fete, Joe bought 3 hotdogs and 5 cans of drink for \$15. Mary bought 4 hotdogs and 2 cans of drink for \$13. All drinks are the same price per can.

Let h represent the cost of hotdogs, and d represent the cost of drinks.

- a. Write 2 equations, in terms of h and d , to represent each purchase.

- b. Solve these simultaneous equations, using either the elimination method or substitution method, and hence find the cost of one hotdog and the cost of one drink.